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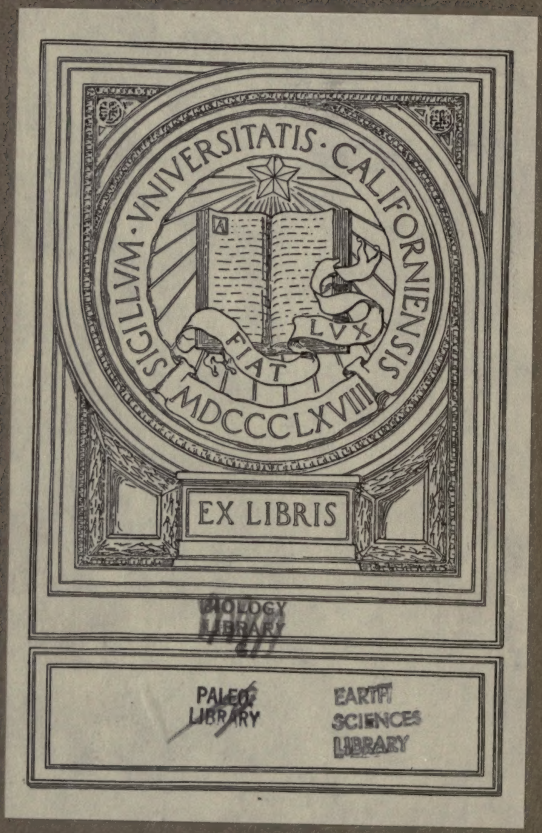

MANUAL

OF

CONCHOLOGY;

STRUCTURAL AND SYSTEMATIC.

WITH ILLUSTRATIONS OF THE SPECIES.

BY GEORGE W. TRYON, JR.

CONSERVATOR OF THE CONCHOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

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VOL. IX.

SOLARIIDÆ, IANTHINIDÆ, TRICHOTROPIDÆ, SCALARIIDÆ, CERITHIIDÆ, RISSOIDÆ, LITTORINIDÆ.

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MANUAL OF CONCHOLOGY.

MONOGRAPH OF THE FAMILY SOLARIIDÆ,

BY WILLIAM B. MARSHALL, B. S.,
Assistant, Conchological Museum of the Academy of Natural Sciences of Philadelphia.

FAMILY *SOLARIIDÆ.*

Shell depressed conic, turbinate, or planorbiform; aperture entire, angular or subcircular; lip and columella simple, interior without nacre; umbilicus wide and deep and usually with crenulated margins; main sculpture usually spiral. Operculum corneous, spiral.

Animal with very large, oval foot, notched in front; tentacles cylindrical, thick, with eyes sessile on swellings near their outer bases. Dentition variable. In Solarium (Pl. 1, figs. 5, 6) and Philippia (Pl. 1, fig. 8) the teeth are long, spiniform, pronged and without a central tooth. In Torinia (Pl. 1, figs. 11, 12) there is a small central tooth, a lateral tooth with pectinated and incised edge united to the central tooth, and two marginal teeth which are straight and digitated at their extremities. The jaw of Solarium and that of Philippia are figured on Pl. 1, figs. 4 and 7.

The proper systematic position of the family Solariidæ was long a matter of doubt. By most authors it was assigned to the neighborhood of Trochidæ. Gray in 1847 (Zool. Proc., p. 151), substituted for Solarium the name Architectoma, which was evidently a typographical error for Architectonica, Bolt., and placed the genus in the Littorinidæ. In 1850 (Figs. of Moll. Anim.), he raised the genus to the rank of a family, and naming it Architectomidæ, he placed it between the Littorinidæ and Melanidæ. In 1853 (Zool. Proc., p. 394), believing the animal to be without teeth, he placed the family in his group Gymno-

glossa, and H. and A. Ad., naming the family Architectonicidæ, made the same disposition of it. Mörch, likewise, failed to find teeth, and formed for the family a new group to which he gave the name Aglossa (Mal. Blatt., p. 129, 1859).

Dr. Troschel found both teeth and jaws to be present, and remarked the affinities existing between the dentition of the Solariidæ and others of the Ptenoglossa (Archiv. für Naturg., i, p. 91, 1861). This arrangement has been generally accepted, most authors placing Solarium near to Scalaria and Ianthina.

The Solariidæ have been monographed by :—

Hanley (Solarium, Torinia), in Sowerby's Thesaurus Conchyliorum, iii, p. 227, 1866.

Reeve, Conchologica Iconica, xv, Solarium, 1864.

Kiener, Coquilles Vivantes, Solarium.

Philippi, in Küster, Conch. Cab., 1853.

A large proportion of the Solariidæ were first described by Hinds in the Proceedings of the Zoological Society, 1844, and afterwards figured in the Zoology of the Voyage of the Sulphur, Plate 14.

Marquis Monterosato published in 1873 a pamphlet entitled "Notizie Intorno ai Solarii del Mediterraneo," having sixteen pages and one plate.

The genus Adeorbis, Searles-Wood, has been placed in the family Solariidæ by Jeffreys, and a few authors have followed this classification. I have deemed it best to exclude the genus : for a discussion of the proper position of Adeorbis, see Journal de Conchyliologie, p. 166, 1885.

Synopsis of Genera.

FAMILY *SOLARIIDÆ.*

SUBFAMILY *SOLARIINÆ.*

Shell depressed conic, angular at the periphery, umbilicus usually with strongly crenulated margin. Operculum corneous, paucispiral.

SUBFAMILY *TORINIINÆ.*

Shell turbinately elevated or planorbiform, whorls usually rounded, margin of umbilicus slightly crenulated. Operculum corneous, conically elevated or plain, externally spiral of num-

erous volutions, internal face smooth, with a spirally twisted median projection.

Subfamily *EUOMPHALINÆ*.

Shell depressed, planorbiform; whorls rounded, in contact except in Eccyliomphalus, in which they are widely dissolute; spire flattened or involute.

(*Solariinæ*.)

Genus SOLARIUM, Lamarck, 1799.

Shell depressed conic, angular at the periphery; aperture subquadrangular, lip simple; umbilicus with crenulated margins, spiral, wide and perspective.

Animal with large foot, notched in front, and having a very pronounced marginal fold; head large, furnished with two tentacles which are short, thick, cylindrical and folded, with the suture below; eyes on swellings near the outer bases of the tentacles; gill-cavity divided by a longitudinal fold. (Pl. 1, figs. 1, 2).

Architectonica (Bolt. 1798), Gray, is a synonym.

Inhabits warm seas, world-wide. Fossil, more numerous. Eocene.

Subgenus Solarium, Lamarck (restricted).

Surface of the shell strongly and closely sculptured longitudinally, spirally sulcate and ribbed. Operculum corneous, paucispiral, with the nucleus subexcentric.

Solariorbis, Conrad, is a synonym.

Subgenus Philippia, Gray, 1840.

Shell without longitudinal sculpture, spiral sculpture nearly obsolete. Operculum flattened; whorls numerous, with the nucleus subcentral, internal face bearing a subspiral calcareous process. (Pl. 1, fig. 9).

Disculus, Deshayes, 1863, is a synonym.

Genus PLATYSCHISMA, M'Coy, 1844.

Shell depressed, trochiform; whorls somewhat rounded, ornamented with small transverse striæ; spire short; whorls

few; aperture oblique; umbilicus small, rounded, its margins without crenulations.

Fossil, Silurian. *United States; Europe.*

Genus FLUXINA, Dall, 1882.

"Shell porcellanous, depressed conical, umbilicate, strongly carinate, with a stout umbilical rib, above which the pillar is thin and emarginate; from the umbilical rib to the carina the basal margin of the aperture is deeply flexuously emarginate; above the carina it is again but less deeply emarginate, then sweeps forward roundly and then slightly recedes before joining the preceding whorl.

This curious form belongs in all probability to the Solariidæ; representing among them Basilissa among the Trochidæ and recalling Platychisma, but with a different aperture. When perfect the margin at the carina must project forward like a claw, or nail, as in Schizostoma. When adult, the nuclear whorls are filled up with a solid deposit of shelly matter, and it is probable that there is a slight notch at the end of the umbilical rib." *West Indies.*

(*Toriniinæ.*)

Genus TORINIA, Gray, 1840.

Shell turbinately elevated or in some instances planorbiform; umbilicus typically moderate to wide, perspective, its margins slightly crenulated; lip and columella simple. Operculum corneous, typically conically elevated, externally spiral, of numerous volutions margined by projecting edges; internal face smooth, bearing a spirally twisted, median projection (Pl. 1, fig. 13).

Tropical seas, world-wide. Fossil, Paris Basin.

Subgenus TORINIA, Gray (restricted).

Shell turbinately elevated; whorls rounded, granulated, spirally ribbed; aperture subcircular, lip simple, columella perpendicular and thickened. Operculum typical.

Animal (Pl. 1, fig. 10) with thick, long obtuse tentacles, the eyes situated upon swellings near their outer bases; foot very large in proportion to body and shell, oval, emarginate and auriculate in front.

Heliacus, d'Orb., 1841, and *Teretropoma*, Rochebrune, 1881, are synonyms. *Antilles; Pacific O.; Indian O.*

Subgenus PSEUDOMALAXIS, Fischer, 1883.

Shell discoidal, planorbiform; whorls and aperture quadrangular. Operculum as in Torinia restricted.

Mediterranean; Madeira.

Subgenus GYRISCUS, Tiberi, 1868.

Shell turbinated, conically turriculated, umbilicated; whorls rounded, granulated, spirally sulcate and ribbed; aperture subcircular, the simple margins united by a callous deposit. Operculum externally flat and multispiral, furnished internally with a central styliform process (Pl. 1, fig. 17). *Mediterranean.*

Subgenus EPISCYNIA, Mörch, 1875.

Shell glassy; periphery with a double series of cilia; apex simple, direct. *Cuba.*

Subgenus CLIMACOPOMA, Fisch., 1883.

This subgeneric name was proposed by Dr. Fischer (Manuel of Conchyliologie, Fasc., viii, p. 714) upon grounds purely hypothetical. When Deshayes found in the Paris Basin a fossil operculum having all the characters of the operculum of the recent Torinia, he suggested that perhaps it belonged to *Solarium patulum*, Lam., but never succeeded in finding it in position. Dr. Fischer, anticipating the discovery of such a species, with the shell of Solarium and the operculum of Torinia, has proposed for the discovery, yet to be made, the above subgeneric name.

Genus OMALAXIS, Desh., 1830.

Shell subdiscoidal, flat or slightly concave above; whorls carinated at the periphery; peristome not continuous; umbilicus wide and deep. Operculum multispiral. *Bifrontia*, Desh., 1832, is a synonym. *Coast of New England—Brazil.* Fossil, Eocene.

(*Euomphalinæ.*)

Genus OPHILETA, Vanuxem, 1842.

Shell discoidal, planorbiform; whorls numerous, in contact, very convex. Fossil, Paleozoic. *O. levata*, Hall. *New York.* (Struct. and Syst. Conch., Pl. 65, fig. 19.)

Genus EUOMPHALUS, Sowb., 1814.

Shell depressed, planorbiform; spire plane or concave; inferior face widely umbilicated: whorls in contact, convex at the periphery, superior face carinated. Fossil, Paleozoic.

Genus SCHIZOSTOMA, Bronn, 1835.

Shell discoidal, planorbiform; whorls more or less angulated at the periphery, with a carina above and below; aperture clasping, subtrigonal, lip sinuous, prolonged into a claw. Fossil, Paleozoic. *United States; Europe. S. Puzosii*, Vern. (Struct. and Syst. Conch., Pl. 65, f. 11.)

Genus ECCYLIOMPHALUS, Portlock, 1843.

Shell subdiscoidal, planorbiform; whorls few, rounded above, flattened below, widely dissolute; lip simple. Fossil, Paleozoic, a few species. *E. serpula*, Kon. (Struct. and Syst. Conch., Pl. 65, fig. 20).

Genus SOLARIUM, Lam., 1799.

Subgenus SOLARIUM (restricted).

S. PERSPECTIVUM, Linn. Pl. 2, figs. 18–21.

Umbilical crenulations brown; whorls spirally sulcate below the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus; color purplish ash or light yellowish brown with interrupted or continuous brown bands next the suture and below the upper sulcus and interrupted brown bands on the ribs about the periphery and another near the umbilicus. Diam. 2·5 inches.

Indian O.; Pacific O.; China to Australia.

S. trochleare and *S. formosum*, Hinds; *S. zonatum* and *S. incisum*, Phil., are synonyms.

Var. AUSTRALIS, Phil. Pl. 2, figs. 20, 21.

A smaller shell than the typical *S. perspectivum*; color olive-brown with a very light chestnut band at the suture, a white band above and a very dark brown band below the upper sulcus, rib above the periphery with an interrupted reddish brown band, periphery and rib below it spotted with yellow or yellowish brown; umbilical crenulations yellowish or purplish brown.

S. MODESTUM, Phil. Pl. 2, figs. 22, 23.

Umbilical crenulations white; whorls spirally sulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus; color ash-white or brownish with an interrupted brown band near the suture, continuous brown bands below the upper sulcus and on the rib above the periphery, periphery and inferior rib with distant brown spots; base with an interrupted brown band near the umbilicus. Diam. 1·3 inches.

China; Society Is.

Very much resembles *S. perspectivum* and may perhaps be a variety of that species; it differs in the coloring only.

S. PERDIX, Hinds. Pl. 2, figs. 24, 25.

Umbilical crenulations small, white; whorls spirally sulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus, ribs crenulated; color pale brownish ash with bands of distant red-brown spots near the suture, on the ribs about the periphery and near the umbilicus. Diam. 1·3 inches.

Malacca; Ceylon; N. W. Australia.

In general appearance this species very much resembles the young state of *S. perspectivum* but is easily distinguishable by the finely crenulated ribs about the periphery and the small pearl-like crenulations of the rib around the umbilicus.

S. DUNKERI, Hanley. Pl. 2, figs. 26, 27.

Umbilical crenulations white; whorls spirally sulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus, ribs crenulated; color fulvous-drab with interrupted brown bands near the suture, on the ribs about the periphery and near the umbilicus, and with obscure, radiating, interrupted brown blotches. Diam. 1–1·5 inches.

Indian Archipelago.

This species resembles *S. perdix*, but is more plentifully spotted and has obscure, radiating blotches.

S. MAXIMUM, Phil. Pl. 3, figs. 31–34.

Umbilical crenulations white; whorls spirally striated, spirally bisulcate below the suture, ribbed at the periphery, spirally

sulcate and ribbed above and below the periphery and near the umbilicus; color as in *S. perspectivum*, except that the brown band below the upper sulcus is usually wanting.

Diam. 2·5 inches.

Java; Ceylon.

S. Taylori, Hanley (Pl. 3, figs. 33, 34), has somewhat coarser sculpture and a double band of color below the suture, but I agree with Reeve in thinking it to be the same shell as *S. maximum*.

S. QUADRICEPS, Hinds. Pl. 4, figs. 39, 40.

Umbilical crenulations tinged with reddish-brown; sculpture and color as in *S. Taylori*. Diam. 2·5 inches.

Zanzibar; Bay of Panama.

This species is certainly very closely related to *S. maximum*, and is probably identical.

S. PICTUM, Phil. Pl. 3, figs. 35, 36.

Umbilical crenulations white; sculpture as in *S. maximum*; color purple-fawn, with two interrupted bands of reddish-chestnut below the suture, the ribs at the periphery spotted with reddish-chestnut; base with a band of distant, round reddish-brown spots near the umbilicus. Diam. 1·5 inches.

New Guinea.

S. fragile, Hinds, is a synonym. This species is probably identical with *S. maximum*.

S. TRYONI, Marshall. Pl. 2, figs. 28, 29.

Umbilical crenulations white; whorls spirally bisulcate below the suture, ribbed at the periphery, spirally sulcate and ribbed above the periphery and near the umbilicus, ribs crenulated; surface of the shell covered with radiating, almost direct, impressed growth-lines; color light purplish chocolate, with an interrupted chestnut band on the space between the suture and the upper sulcus, another very narrow band just below the upper sulcus, none of the spots reaching to the second sulcus, a band reaching from the periphery beyond the rib above it and changing from orange-yellow on the periphery to chestnut above; base with the rib of the periphery elevated and an interrupted band of orange-brown near the umbilicus. Diam. 1 inch.

? Moluccas.

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This shell, which is just approaching maturity, has the color and sculpture of the upper surface very much like to that of *S. maximum*. The distinguishing characteristics are the basally projecting rib of the periphery and the absence of the usual rib and sulcus below the periphery.

S. REGIUM, Hanley. Pl. 2, fig. 30.

Umbilical crenulations white; whorls spirally bisulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus; color purplish flesh, with an interrupted chestnut band spreading from the suture beyond the second sulcus, one on the rib above the periphery and a very fine interrupted band just above the rib.

Diam. 1·2 inches.

Habitat unknown.

In sculpture this species resembles *S. quadriceps;* the color bands are its chief characteristics.

S. PURPURATUM, Hinds. Pl. 4, figs. 41, 42.

Umbilical crenulations pale fuscous; sculpture as in *S. maximum;* color dark purplish ash with a double band of chestnut near the suture, periphery and the superior rib plentifully blotched with duplicated brown spots; base slightly convex, plentifully marked with radiating reddish brown streaks.

Diam. 1·5 inches.

Moluccas.

S. stellatum, Phil., is a synonym.

This species differs from *S. maximum* in the darker color, the duplicated spots, the more convex base and the fuscous crenulations of the umbilicus.

S. GRANULATUM, Lam. Pl. 5, figs. 53, 54.

Umbilicus contracted, crenulations very strong; whorls spirally sulcate with four principal sulci and traces of others, the impressed growth-lines of the spire breaking the surface into coarse granules; color purplish ash or livid flesh, with a band of distant yellowish brown spots next the suture and a few light spots sprinkled over the surface; base many ribbed and crenated, ribs specked with yellowish brown. Diam. 2 inches.

North Carolina to West Indies;
Panama to L. California.

Solarium perspectivum, Chemn. (in part), is a synonym. Hinds, in the "Voy. of the Sulphur," erroneously gives Asia as the habitat of this species.

S. VERRUCOSUM, Phil. Pl. 3, figs. 37, 38.

Umbilicus contracted, crenulations white, very strong; whorls spirally sulcate and, in the spire, granose; color yellowish cream with interrupted bands of chestnut-red below the suture, at the periphery and above and below the middle of the whorl; base many-ribbed and crenated, ribs specked with yellowish brown. Diam. 1–2 inches.

West Indies.

S. nobile, Hanley, is a synonym.

This species is probably synonymous with *S. granulatum*.

S. LÆVIGATUM, Lam. Pl. 4, figs. 43, 44.

Umbilicus narrow, crenulations white or cream color; whorls smooth, spirally quadri-sulcate, ribbed above, on and below the periphery and near the umbilicus; color pinkish-purple plentifully sprinkled with yellowish-brown; base with fine, revolving interrupted orange-brown lines and plentifully blotched near the periphery with the same color. Diam. 1–1·5 inches.

India.

Easily distinguished by the pinkish-purple color, the smoothness of the shell, the four spiral sulci and the fine revolving orange-brown lines on the base.

S. REEVEI, Hanley. Pl. 4, figs. 45, 46.

Shell very conoidal; umbilicus rather narrow, with white crenulations; whorls spirally unisulcate or bisulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus, ribs finely crenulated, entire surface of the shell covered with close, obliquely radiating growth-lines; color pinkish-flesh with interrupted orange-brown bands below the suture, on the ribs about the periphery, and finer bands near the middle of the whorls. Diam. 1 inch.

Australia.

Easily distinguished by the fine crenulations of the narrow umbilicus, the very conoid shape and the fine sculpture. Reeve has suggested that this species may be an Australian dwarf

variety of *S. lævigatum:* The two species agree in general shape, in the narrow umbilicus and in the general color, but in *S. lævigatum* the main sculpture is spiral while in *S. Reevei* it is longitudinal.

S. FULIGINOSUM, Hinds. Pl. 4, figs. 47, 48.

Umbilical crenulations reddish-brown; whorls spirally sulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus; color livid-white with obliquely radiating dusky-brown blotches and interrupted brown bands near the suture, on the ribs about the periphery and near the umbilicus. Diam. 2 inches.

Habitat unknown.

S. maculatum, Reeve, and *S. Hanleyi*, Sowb. (Pl. 5, figs. 55, 56), are synonyms; the type of the latter is a deformed specimen in which the base is very convex. This species is easily distinguishable by the radiating brown blotches.

S. CUMINGII, Hanley. Pl. 5, figs. 57, 58.

Umbilical crenulations tinged with reddish-brown; whorls spirally sulcate near the suture, ribbed at the periphery, spirally sulcate and ribbed below the periphery and near the umbilicus; color livid-yellowish with obliquely radiating, interrupted reddish-chestnut blotches and light chestnut bands at the suture, on the ribs about the periphery and near the umbilicus. Diam. 1·5 inches.

Habitat unknown.

This species differs from *S. fuliginosum* in having the blotches of a lighter color and interrupted and in the absence of a distinct rib above the periphery. It is perhaps only a variety.

S. BAIRDII, Hanley. Pl. 4, fig. 49, 50.

Whorls with radiating growth-lines broken into five series by spiral sulci, periphery ribbed, spirally sulcate and ribbed below the periphery and near the umbilicus, ribs crenulated; color pale-fulvous with remote obscure spots. Diam. 20 mill.

Habitat unknown.

S. PLACENTULA, Hinds. Pl. 4, fig. 51, 52.

Shell discoid, very depressed; whorls smooth, regularly spirally striated, broadly ribbed at the periphery, spirally sulcate

and ribbed near the umbilicus, ribs crenulated; color pale-fulvous with distant reddish brown spots on the periphery; base slightly concave near the periphery, somewhat swollen near the middle. Diam. 12–25 mill.

Bay of Magdalena, L. California.

This species is remarkable for the absence of a sulcus below the suture, and ribs above and below the periphery.

S. IMPRESSUM, Nevill. Pl. 4, figs. 52, *a b.*

Umbilical crenulations white; whorls 5, granosely shouldered, obsoletely spirally ribbed, ribs four or five, minutely granose, periphery roundly angular; color glassy white, with obliquely radiating patches of chestnut, or of a uniform reddish; base very convex, with two impressed spiral lines and an interrupted brown band near the umbilicus, umbilical wall obsoletely spirally ribbed; aperture subquadrangular. Diam. 6 mill.

Ceylon.

Unfigured and Doubtful Species.

S. CALCAR, Costa.	*Mediterranean.*
S. WROBLEWSKYI, Mörch.	*Rio Janeiro.*
S. KREBSII, Mörch.	*Porto Plata; Curaçao.*
S. TRICARINATUM, Stearns.	*West Indies.*
S. VALENCIENNESII, Mörch.	*Realjo.*

Subgenus PHILIPPIA, Gray, 1840.

S. HYBRIDUM, Linn. Pl. 5, figs. 59–62.

Umbilicus contracted, crenulations white, very strong; whorls smooth, ribbed at the periphery, spirally sulcate, and ribbed above and below the periphery and near the umbilicus; color varying shades of reddish brown with patches of white; base very convex, usually of lighter color than the upper surface. Diam. 20 mill.

Philippines; Java; Australia; Ceylon.

S. Layardi, A. Ad., and *Trochus perspectivunculus*, Meusch., are synonymous.

Var. UNDATUM, Hanley. Pl. 5, fig. 61, 62.

Color white, with narrow, radiating, undulating, reddish blotches; base with alternating bands of yellowish brown and white.

Var. AUSTRALIS, Hanley (unfigured).

Tawny brown or reddish brown color, either with spiral lines of a darker color or banded above with small, close, white spots and below with angulated white spots; base and apical whorl with spiral light and dark lines of color.

S. CINGULUM, Kiener. Pl. 5, figs. 63, 64.

Umbilicus contracted, crenulations white, very strong; whorls regularly, spirally striated, ribbed at the periphery, spirally sulcate and ribbed above and below the periphery and near the umbilicus; color white, upper part of the whorl yellowish-brown with rays of the same color descending to the periphery; base slightly convex and of a pale-smoky color. Diam. 1 inch.

Sandwich Is.; Fiji Is.; Philippines.

This species is easily distinguished by the scalloped white band above the periphery. The shell differs from *S. hybridum* in the coloring and in the less convex base, but is probably only a variety of that species.

S. OXYTROPIS, A. Ad. Pl. 5, figs. 65, 66.

Shell depressed, umbilicus wide; whorls smooth, plane, ribbed at the periphery, spirally sulcate and ribbed above the periphery and near the umbilicus; color white, glassy, ornamented with yellowish brown; base convex. Diam. 13 mill.

New Caledonia.

The type of this species which has been considered by Hanley to be a young specimen of *S. hybridum*, differs from that form in being quite depressed, in the widely open umbilicus, and in the absence of a rib below the periphery.

S. PSEUDOPERSPECTIVUM, Brocchi. Pl. 5, figs. 67, 68.

Shell very depressed; umbilicus rather narrow; whorls planulate above, having three nearly obsolete moniliform raised bands, ribbed at the periphery, spirally sulcate and ribbed near the umbilicus; base slightly concave near the periphery, convex in the middle. Diam. 1·4 inches.

Mediterranean, Naples.

S. perspectiviforme, Tiberi; and *S. discus*, Phil., are synonyms.

S. MEDITERRANEUM, Monts. Pl. 5, figs. 69, 70.

Whorls 4–5, smooth, rapidly increasing, ribbed at the periphery, spirally sulcate and ribbed above the periphery and near the

umbilicus; color fulvous; base with numerous concentric impressed lines; aperture subpyriform. Diam. 1 inch.

Mediterranean.

S. pseudoperspectivum of authors (not Brocchi), is a synonym, to which may be added *S. sulcatum*, O. G. Costa, 1841 (not of Lamarck, 1822), and *S. pulchellum*, Tiberi, 1868 (not of Michelotti, 1841).

S. LUTEUM, Lam. Pl. 5, fig. 71, 72.

Umbilical crenulations white; whorls few, somewhat rounded, ribbed at the periphery, spirally sulcate and ribbed below the periphery; color yellowish with bands of very fine brown dots below the suture, and on the ribs about the periphery; base slightly convex, spirally striated; aperture subrotund.

Diam. 7·5 mill.

Australia.

S. CONULUS, Weinkauff. Pl. 5, fig. 73, 74.

Shell conical; umbilical crenulations white; whorls few, rounded, ribbed at the periphery, spirally sulcate and ribbed below the periphery; color brownish-yellow, the ribs at the periphery obscurely spotted with white; aperture subrotund. Diam. 13 mill.

Mediterranean.

S. hybridum, Monts. and Petit (not Linn.), is a synonym.

This species, which many authors include in the synonymy of the preceding, differs from it in being more elevated, in the darker color, in the absence of the band below the suture and in the obscure banding of the ribs about the periphery.

Genus FLUXINA, Dall, 1882.

F. BRUNNEA, Dall (unfigured). *West Indies.*

SUBFAMILY *TORINIINÆ.*

Genus TORINIA, Gray, 1840.

Subgenus TORINIA (restricted).

T. VARIEGATA, Gmelin. Pl. 5, figs. 75–79; Pl. 1, figs. 14–16.

Shell depressed or conically elevated; whorls longitudinally striated, spirally sulcate and ten-ribbed, that on the periphery and the one below it being the strongest; color radiating, alter-

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nate, stripes of white and brown; margin of umbilicus crenulated, umbilical wall with a crenulated, medial rib.

Diam. 10–17 mill.

Red Sea; Indian O.; Pacific O.

T. gyra, Meusch.; *T. areola*, Gmel.; *T. perspectiviuncula*, Dillwyn, and *T. tesselata*, Desh., are synonyms.

Var. DEPRESSA, Phil. Pl. 5, figs. 78, 79.

Shell very depressed; color white with radiating brown streaks, interrupted white bands on the strong ribs about the periphery, umbilical crenulations and surrounding portion of the base white.

Var. PLANULATA, Hanley. Pl. 5, fig. 77.

Shell very depressed; color brownish, with interrupted white bands above the suture and on the two strong ribs about the periphery.

In the American Journal of Conchology (vol. v, p. 81, 1869), W. H. Pease states that the operculum of *T. variegata* from the West Coast of America, differs widely from that of the same species from Hawaii and the East Indies. He thus describes it: "It is composed of plates disposed in the shape of a screw, of three whorls. The plates are wide apart, and furnished on their edges with short, stout bristles and the sides reticulated with raised striæ" (Pl. 1, fig. 14–16). I have examined specimens of the West Coast species, kindly loaned by Dr. Robert E. C. Stearns, of the United States National Museum, and am unable to verify Mr. Pease's statement, the opercula being normal.

T. DORSUOSA, Hinds. Pl. 5, figs. 80, 81.

Shell depressed; whorls longitudinally striated, spirally sulcate and ten-ribbed, the rib on the periphery and that below it being strongest; color reddish brown, confusedly blotched with white, the two stout ribs about the periphery with interrupted white bands; umbilicus moderate, crenulated, umbilical wall with a spiral medial rib. Diam. 13 mill.

Pacific Islands.

T. CYLINDRICA, Gmelin. Pl. 5, fig. 82.

Shell conic, elevated; whorls longitudinally striated, spirally sulcate and ten-ribbed, the three ribs about the periphery being strongest; color chestnut-brown, sparingly mottled with white

at the periphery and above the suture; margin of umbilicus slightly crenulated, umbilical wall with three spiral ribs.

Alt. 13–18 mill.

West Indies.

T. Heberti, Desh.; *T. cyclostoma*, Hanley; *T. cylindracea*, Dillwyn, are synonyms.

T. CYCLOSTOMA, Menke. Pl. 5, fig. 83, 84.

Sculpture as in *T. cylindrica*; color greenish black, with interrupted white bands above the suture and on the periphery; umbilical wall with two or three spiral ribs. Alt. 13 mill.

West Indies.

T. Æthiops, Hanley, is a synonym.

This species differs from the preceding in coloring, but is perhaps only entitled to varietal rank.

T. ÆTHIOPS, Menke. Pl. 5, figs. 85, 86.

Shell globose, conic; whorls longitudinally sulcate, spirally sulcate and ribbed, the three superior ribs the smallest; color greenish black with interrupted white bands above the suture, on the periphery and on the rib below it, and a brownish white band in the aperture; umbilical wall with two spiral ribs.

Alt. 10 mill.

West Indies.

Easily known by the globose shape, the banding, the two ribs on the umbilical wall and the whitish band in the aperture.

T. NUBILA, Menke. Pl. 5, fig 86 *a*.

Shell globose-conic; whorls eleven-ribbed, sulci punctate, color whitish, the middle of the whorls with smoky brown spots; umbilicus moderate, umbilical wall with three or four spiral ribs.

Alt. 10 mill.

West Indies.

T. TROCHOIDEA, Desh. Pl. 5, figs. 87, 88.

Shell conic; whorls longitudinally striated, spirally sulcate and ten-ribbed, rib at the periphery elevated, very strong, granular; color grayish white; margin of umbilicus crenulated, umbilical wall with two spiral ribs. Alt. 20 mill.

Manillà; Society Islands.

T. dealbata, Hinds, is a synonym.

T. MIGHELSI, Phil. Pl. 6, figs. 89, 90.

Shell convex; whorls 4–5, longitudinally striated, obsoletely spirally sulcate and ribbed, periphery strongly sulcate, suture profound; color grayish ash throughout; umbilicus rather open, its margin slightly crenulated, umbilical wall with or without spiral ribs. Diam. 8–12 mill.

Sandwich Islands.

It is *T. cyclostoma*, Migh. (not Menke).

T. DILECTA, Desh. Pl. 6, figs. 91, 92.

Shell discoidal, slightly convex; whorls 6, longitudinally striated, spirally sulcate and ribbed, granular, periphery strongly ribbed, suture distinctly channeled; color tawny; umbilicus very wide, with a crenulated rib at the border.

Diam. 12·5 mill.

Isle of Bourbon.

T. STRAMINEA, Gmel. Pl. 6, figs. 93–96.

Shell convex; whorls longitudinally striated, spirally sulcate and ribbed, ribs broad and flat, suture profound; color uniform yellowish brown; umbilicus wide, ribbed at the border, rib crenulated, umbilical wall with or without spiral ribs.

Diam. 1 inch.

Tranquebar; Philippines; New Guinea.

T. fulva, Hinds, is a synonym.

Var. SICULA, Cantr. Pl. 6, figs. 95, 96.

The older authors gave the East Coast of Africa as the habitat of *S. stramineum*, but afterwards a smaller shell agreeing with this species in sculpture and color, and differing only in size, was found in the Mediterranean and identified by Philippi (Enum. Moll. Sicil., i, p. 173) as the same shell. Cantraine considering the difference in size and the widely separated habitats has made the Mediterranean shell a distinct species, and named it *T. sicula*. At the best Cantraine's species is but a variety, of which *T. fallaciosa*, Tiberi, is a synonym.

T. INFUNDIBULIFORME, Gmelin. Pl. 6, figs. 97–99.

Shell depressed, convex; whorls rounded, descending slowly, channeled at the suture, longitudinally sulcate, spirally sulcate and ribbed, ribs granular; color uniform brownish; umbilicus

very wide, deeply channeled, umbilical wall spirally ribbed; aperture round, nearly continuous, interior with alternating bands of light and dark brown. Diam. 20 mill.

Philippines; Lord Hood Isl.; Sandwich Is.

T. cylindracea, Hanley (in part); *T. Chemnitzii*, Kien., are synonyms. *T. crenella*, Linn., is possibly the same, but the description is too vague.

Var. STRIGATA, Hanley. Pl. 6, fig. 99.

Periphery and the rib below it ornamented with white and smoky-brown spots.

T. FENESTRATA, Hinds. Pl. 6, figs. 100, 1.

Shell depressed, slightly convex; whorls granular, longitudinally striated, spirally sulcate and ribbed, the three ribs about the periphery being strongest, suture channeled; base rounded, granular; umbilicus wide, margin many crenulated, umbilical wall with fine spiral ribs; aperture round, nearly continuous. Diam. 10 mill.

New Guinea.

Hinds states that the type of this species was a dead shell, without color and, evidently, had been lying in the mud for some time. He thinks that perhaps the cancellation is somewhat more distinct than may be looked for in living specimens.

T. VIRGATA, Hinds. Pl. 6. figs. 2, 3.

Shell discoidal; whorls granose, flat on top, rounded below, narrowly channeled at the suture, longitudinally striated, spirally sulcate and ribbed, the rib on the periphery and that below it being strongest; color pale-fulvous, with chocolate-red bands above and below the suture, on and below the periphery and near the umbilicus; umbilicus moderate, with white crenulations, umbilical wall of a chocolate-red color, not ribbed; aperture slightly angular. Diam. 6 mill.

New Guinea.

T. CÆLATA, Hinds. Pl. 6, figs. 4, 5.

Shell discoidal; whorls spirally sulcate and tubercular near the suture, radiately striated in the middle, periphery broad, with two tubercular ribs; color fuscous, shining; base rounded

radiately striated, spirally sulcate; umbilicus wide, margin numerously crenulated, umbilical wall with a spiral rib.

Diam. 9 mill.

Straits of Macassar.

Easily known by the flatness of the shell and the two very prominent ribs about the periphery. Hanley's figure of this species in Thes. Conch. is a very poor representation.

T. DISCOIDEA, Pease. Pl. 6, fig. 6.

Shell very depressed; whorls finely granulated, slightly channeled at the suture, spirally sulcate and ribbed, the two ribs of the periphery being very strong; color white, clouded with very faint chocolate; base rounded, umbilicus lightly crenulated, channeled, umbilical wall with two spiral ribs. Diam. 6·3 mill.

Paumotus.

T. ASPERA, Hinds. Pl. 6, figs. 7, 8.

Shell discoidal, slightly conical; whorls rough, tubercular, radiately striated, spirally sulcate, strongly ribbed on the periphery; base rounded, umbilicus very wide, its margin numerously crenulated. Diam. 9·4 mill.

Straits of Macassar.

The type of this species was a dead shell and consequently without color.

T. ARCHITÆ, Costa. Pl. 6, figs. 9, 10, 11.

'Shell discoidal; whorls flat above, rounded below, channeled at the suture, longitudinally and spirally sulcate, crenulated; color yellowish white; umbilicus very wide, margin finely crenulated. Diam. 7·5 mill.

Mediterranean.

T. SOWERBYI, Hanley. Pl. 6, figs. 12, 13.

Shell nearly discoidal; whorls channeled at the suture, with four granose cingulæ, the upper three of which are equal and the fourth greater, last whorl with 13–14 cingulæ, periphery sloping off, not biangulate; color yellowish white, clouded or variegated; umbilicus moderate, its margins crenulated. Diam. 6 mill.

Mediterranean, Tunis.

This species is distinguished from the preceding by the much more narrow umbilicus.

T. BISULCATA, d'Orb. Pl. 6, figs. 14–16.

Shell depressed, conic; whorls 5, longitudinally striated, spirally sulcate and five-ribbed above, periphery two-ribbed, base six-ribbed; color dirty white; umbilicus moderate, margin crenulated, umbilical wall without ribs. Diam. 10 mill.

West Indies.

Hanley's figure of this species in Thes. Conch. is very poor.

T. DELPHINULOIDES, d'Orb. Pl. 6, figs. 17–19.

Shell depressed, conic; whorls 4-ribbed, body-whorl 12-ribbed; color uniform whitish; umbilicus broad, margin slightly crenulated, not channeled, costate; aperture round. Diam. 7·5 mill.

West Indies.

This and the preceding may be different stages of growth of the same species.

T. NANA, Koch. Pl. 6, figs. 20, 21.

Shell depressed, globular; whorls rounded, angular above, upper part of the whorl with four elevated ribs; color white with radiating red blotches; base smooth; umbilicus moderate, cup-shaped, margin strongly crenulated, umbilical wall radiately striated, and having spiral, granular ribs; aperture roundly quadrangular. Diam. 6 mill.

Chili.

T. EGENA, Gould. Pl. 6, figs. 22, 23.

Shell globose; whorls rounded, channeled at the suture, spirally sulcate near the umbilicus, last whorl 5-ribbed, the two nearest the suture being granular; color nearly white; base convex; umbilicus wide, margin strongly crenulated; aperture subcircular. Diam. 7·5 mill.

New Zealand.

This and the preceding species present such an intermixture of the characters of Torinia and Solarium that I am in doubt as to which genus they should be referred.

T. BOREALIS, Verrill and Smith. Pl. 6, figs. 24, 25.

Shell depressed; whorls 4, crossed by numerous, flexuous, low ribs, with shorter ribs interpolated near the periphery, periphery strongly ribbed, body-whorl flattened just above the periphery and having about 6 small spiral ribs which are separated by

impressed spiral lines; color yellowish brown; base slightly convex, having numerous fine spiral lines near the periphery, also covered with low ribs radiating from the umbilicus, near which they are nodulous. Diam. 12 mill.

Coast of New England.

T. ROSULENTA, Watson. Pl. 6, fig. 34.

Umbilicus very wide; whorls 5, shouldered with three or four elevated spiral threads, last whorl with numerous spiral threads, the upper four of which are very strong; color ruddy-yellow with bright crimson spots; umbilical wall with numerous spiral threads; aperture round. Diam. 6 mill.

Port Jackson.

Unfigured and Doubtful Species.

T. RIISEI, Mörch. *West Indies.*
T. SULCIFERA, Pease. *Polynesia.*
T. BICARINATA, Phil. *China Sea.*

Probably not a member of this family.

T. TRICINCTA, Phil. *Guinea.*
T. IMPLEXA, Migh. *Oahu.*

Subgenus PSEUDOMALAXIS, Fisch., 1883.

T. ZANCLEA, Phil. Pl. 6, figs. 26–28.

Shell minute, planorbiform; whorls quadrangular, periphery broad, with a rib above and another below; color fulvous, clouded with alternate light and dark; umbilicus very wide; aperture nearly square. Operculum as in typical Torinia.

Diam. 3·5 mill.

Mediterranean.

Subgenus GYRISCUS, Tiberi, 1867.

T. JEFFREYSIANA, Tiberi. Pl. 6, figs. 29, 30; Pl. 1, fig. 17.

Shell turbinate; whorls 7, rounded, granular in spiral series, suture profound, last whorl slightly depressed at the base; color yellowish, passing into a pale reddish brown; umbilicus moderate, deep; aperture subrotund, the margins united by a callous deposit, columellar lip sinuous, reflected, closing a part of the umbilicus. Diam. 8–9, alt. 10–11 mill.

Mediterranean.

Subgenus Episcynia, Mörch, 1875.

T. inornata, d'Orb. Pl. 6, figs. 32, 33.

Shell convex; whorls 5, smooth, glassy white, shining, roundly carinate at the periphery; base convex; umbilicus moderate, smooth; aperture oval. Diam. 3 mill.

St. Thomas, West Indies.

The smoothness of the shell, its glassy appearance, its minuteness and the simple umbilicus are perphaps enough to rule this subgenus out of the family.

Genus OMALAXIS, Desh., 1830.

O. Pernambucensis, Watson. Pl. 6, figs. 35, 36.

Shell discoidal; whorls about four, contiguous, except the last which is slightly dissolute, convex, obsoletely spirally threaded, longitudinally ribbed; color white, glassy or porcellanous; umbilicus very wide, exposing all the whorls; aperture oval, lip not in contact with the whorl above. Diam. 2·5 mill.

Pernambuco.

O. nobilis, Verrill. Pl. 6, fig. 31.

Shell planorbiform, upper surface nearly flat, base very concave; whorls 5, nearly quadrangular, the two peripheral angles strongly granosely carinate, peripheral area spirally ribbed, surface of the shell with radiating, elevated growth-lines; color pale chestnut, irregularly and indistinctly banded with whitish chestnut; base spirally striated; aperture trapezoidal with the outer corners angular and the inner corners rounded. Operculum thin, horny, multispiral, slightly concave. Diam. 11 mill.

Chesapeake Bay.

Unfigured Species.

O. lirata, Verrill. *Newport, R. I.*

CALIFORNIA

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Family *IANTHINIDÆ.*

Shell thin, fragile, turbinated; whitish or purplish; aperture oval or subtetragonal, the columella a little twisted, lip simple, curved. No operculum.

Animal pelagic, sustained by a vesicular body called the float, and to which the eggs are attached. The float is composed of a mass of vesicles filled with air, the walls resisting, subcartilaginous, supported by a narrow peduncle, formed by and adhering to the foot. Sexes separate, no copulatory organ. Rostrum proboscidiform; no jaws; radula composed of a great number of elongated teeth, no central tooth. Carnivorous. Secretes a purple fluid, which is ejected from the branchial cavity, when irritated.

Genus IANTHINA, Lam., 1799.

Head large, muzzle-shaped, eyes not visible or sessile, tentacles forked so that each appears like a pair, foot rather short, the epipodial lobe somewhat elongated and ciliated, branchial plumes two, unequal.

The float is found in both sexes, and whilst in the female the eggs are usually attached to the lower surface thereof, the animal in some species is viviparous; embryos taken from the uterus are operculated, the head has a ciliated velum, the eyes are large and well pigmented.

Shell imperforate, without epidermis, fragile, trochiform or turbiniform, nucleus small, styliform, oblique, spire light purplish white, base deeper purple; whorls few, convex, with striæ of growth, angular or gathered at the periphery; outer lip with a sinus in the middle, columella thin, twisted.

About 30 nominal species have been described, from the Atlantic and Pacific Oceans; I reduce them to three species, with a few varieties.

A species is found in the Pliocene of Italy.

Reeve monographed Ianthina in 1858, including 25 species, a portion of which he first described, and Mörch, in the Journal

de Conchyliologie, 261, 1860, gave a more scientific synopsis of the species, increasing their number to 31; finally, Sowerby (Thesaurus Conchyliorum, v, 1882) reduced them to 11.

The following sections of Mörch have very slight value. I include the first and second in a single species, whilst the other three may divide two species between them.

Section Iodes (Leach), Gray, 1847.

Solid, depressed conical, last whorl obtusely carinate. Viviparous. I. Britannica, Leach.

Section Achates (Gistel), Mörch, 1860.

Shell thin, acutely carinated. Oviparous, marsupial. Proboscis inflated. I. fragilis, Lam.

Section Ianthina (Bolten, 1798), Mörch, 1860.

Globose, with deep suture, columella produced, aperture sinuated below. Oviparous, marsupial, proboscis cylindrical, branchia protruding. I. nitens, Menke.

Section Amethistina (Schinz, 1825), Mörch, 1860.

Like the last, but aperture rounded below. I. pallida, Harvey.

Section Iodina, Mörch, 1860.

Costulate, lip incised. Oviparous, marsupial. I. exigua, Lam.

The Ianthinæ, or Purple Snails, are gregarious and very abundant on the surface of the ocean where the water is deep and similar in color to themselves. They live on Velellæ, Porpitæ, Physaliæ and other soft animals, usually of similar violet coloring; finally a bluish crustacean dwells on their float. According to Dr. Coates they sometimes eat their own species. The float is readily, even spontaneously detached, and is often encountered in numbers, apart from the animal. If its vesicles are punctured the air escapes and the animal falls to the bottom, from which it appears unable to ascend, and is supposed to perish. The stem of the float is attached to the posterior part of the foot; the anterior part of the foot becomes tubular by the turning over of its margins, and when protruded from the water, encloses a bubble of air, which, being enveloped in a mucous secretion, is added to the anterior portion of the float. There has been much written upon the homologies of this raft; the accepted opinion compares it with the byssus of lamellibranchs.

M. Lucaze-Duthiers made interesting observations upon the secretion of the float by Ianthinæ in captivity (Ann. Sci. Nat., iv, 329, 1865; Ann. Mag. Nat. Hist., xvii, 278, 1866); Mr. Arthur Adams has also given notes on the habits of these animals (Ann. Mag. N. Hist., 3 ser., x, 417). Dr. Ruschenberger, in his Voyage around the World, p. 21, remarks that when captured, the Ianthina emits about a teaspoonful of violet liquid, and he supposes that this copious discharge, like the ink of the cuttle-fish, serves to facilitate the escape of the mollusk from its enemies.

Genus RECLUZIA, Petit, 1853.

Shell paludiniform, thin, white under a brown epidermis; whorls ventricose; aperture obliquely ovate, slightly effused at the base, peristome not continuous, the outer lip acute, entire, columella oblique, somewhat sinuous. No operculum.

Animal like Ianthina, provided with a vesicular float.

The species inhabit the *Arabian Gulf* and *Pacific Ocean*.

Genus SCALITES, Conrad, 1842.

Shell turriculated, whorls flattened above, carinated at the shoulder, and convex below; outer lip sinuous; umbilicus none or very small. S. ANGULATUS, Conr. Silurian. *United States*. (Struct. and Syst. Conch., t. 67, f. 51.)

The systematic position given this fossil as well as its subgenera, is mere guess-work.

Subgenus RAPHISTOMA, Hall, 1847.

Shell turbinated, more depressed, with carinated shoulder, and convex below, as in the typical group. S. STAMINEA, Hall (Struct. and Syst. Conch., t. 67, f. 52).

Subgenus HOLOPEA, Hall, 1847.

This palæozoic group is composed of incongruous elements; its first species has been referred to Littorinidæ, another evidently belongs to Naticidæ, a third resembles Ianthina. The species are mostly casts, and there appears to be no good reason for retaining the group. *Cyclora*, Hall, 1845, has been considered synonymous.

Genus IANTHINA, Lam., 1799.

I. FRAGILIS, Lam. Pl. 9, figs. 94–5; Pl. 10, figs. 6–10.

Whorls slopingly convex, with obtusely angulated periphery, outer lip of aperture very slightly sinuous, violaceous white above, uniform purplish or violaceous below. Diam. 1·5 inches.

Mediterranean, Atlantic O., Indian O., Pacific O.

This is probably Linnæus' *Helix Ianthina.*

Reeve and others distinguish two species which they suppose Lamarck at first confounded under the name of *I. fragilis*; they restrict this name to the more acutely angulated forms (figs. 94, 3, etc.), whilst *I. communis*, Lam. (fig. 99)—the name by which he intended to replace his *I. fragilis*—is reserved for those with obtuse periphery. I confess that I cannot divide them satisfactorily; consequently I include here as synonyms a series of intermediates, which have received the names of:

I. Costæ, Mörch, proposed for *I. bicolor*, Costa (not Menke); *I. vulgaris*, Gray; *Helix Ianthina*, Forskal; *I. violacea*, Adams; *I. penicephala*, Peron; *I. violacea*, Mörch; *I. grandis*, Brown; *I. striulata*, Carp. = *I. Carpenteri*, Mörch (fig. 3), and var. *contorta*, Carp., from Mazatlan; *I. Orbignyi*, Mörch; *I. bicolor*, Menke.

Var. PLANOSPIRATA, Ads. and Reeve. Figs. 94–98.

Depressed, with slopingly convex whorls, obliquely plicately striated; columella arched, somewhat dilately reflected; aperture transverse, a little sinuous on the middle of the outer lip.

Diam. 1·4 inch.

Atlantic Ocean, St. Helena, etc.

May be nominally distinguished from *I. fragilis* by its more rounded periphery and more depressed spire, as well as by the light color of the base immediately around the columella; but apparently connects with it by intermediate stages. Among these, having the form of *planospirata*, but with usually uniform purple base, may be placed here as synonyms *I. depressa*, Reeve (fig. 97); *I. cærulata*, Reeve (fig. 96); *I. casta*, Reeve (fig. 95); *I. balteata*, Reeve (fig. 98); forms with more elevated spire, approaching *I. fragilis* are *I. bicolor* and *I. fragilis*, of Lesson.

Var. BRITANNICA, Leach. Figs. 100–2, 5–9.

Shell a little more elevated than in the type, whorls more exserted and more convex, darker colored.

I. rotundata, Leach; *I. grandis*, Reeve (fig. 2); perhaps *I. Smithiæ*, Reeve (fig. 1); *I. affinis*, Reeve (fig. 6); *I. fibula*, Reeve (fig. 5); *I. roseola*, Reeve (fig. 7); *I. involuta*, Reeve (fig. 8), peculiar growth the result of an injury; *I. Africana*, Reeve (fig. 9), are synonyms.

Var. TROCHOIDEA, Reeve. Fig. 10.

Spire much more elevated, the whorls flatter.

Zanzibar, Mauritius.

I. GLOBOSA, Swainson. Pl. 10, figs. 11–16.

Thin, inflated, subglobose, spire short, somewhat immersed; whorls rounded, outer lip a little sinuous in the middle, aperture produced into a short open channel at the base. Light violaceous, becoming a little darker towards the base.

Diam. 1·5 inches.

Mediterranean, Atlantic O., Mazatlan, Mauritius, etc.

The synonyms are *I. prolongata* and *I. violacea*, Blainv.; *I. nitens*, Menke (fig. 11); *I. communis*, Costa, Chenu, Scacchi; *I. elongata*, Maravigna; *I. splendens*, Monts., and var. *minor*, Monts.; var. *Atlantica*, Mörch; *I. decollata*, Carp. (fig. 13); *I. nana*, Gray; *I. iricolor*, Reeve (fig. 14).

Var. PALLIDA, Harvey. Figs. 15, 16.

Lower part of aperture broadly rounded, instead of being produced and subchanneled.

Europe.

Although usually considered a distinct species, this is rather an occasional from of *I. globosa* than a variety. In a series from the West Indies before me the intermediate apertures make a connecting series. The synonyms are *I. rosea*, Anton; *I. patula*, Phil.; var. *minor*, Monts. (= *I. læta*, Monts.); *I. striolata*, Ads. and Reeve (fig. 16).

I. EXIGUA, Lam. Pl. 10, figs. 17–22.

Conically turbinated, whorls a little flattened above, forming an obtuse peripheral angle, spire not sunken at the sutures, surface closely flexuously striate, corresponding with a deep per-

ipheral incision on the outer lip, aperture broadly produced below; light violaceous, darker in the smaller specimens, light banded at the suture. Diam. ·25–·75 inches.

California, *Sandwich Islands*, *Australia*, *Chili*, *Cuba*, *Madeira*, *Atlantic O.*, *Isl. of Bourbon*.

The synonyms are *I. bifida*, Nuttall (fig. 19); *I. capreolata*, Montrouzier (fig. 18); *I. Vinsoni*, Desh. (fig. 20); and ? *I. umbilicata*, Orb. (figs. 21, 22), the latter a malformation.

Unfigured Species of Ianthina.

I. ALBA, Anton. *Hab. unknown.*
I. MEGASTOMA, A. Ad. *Indian Ocean.*
I. NITIDA, A. Ad.
I. INCISA, Phil. *Senegal.*

The three latter are probably synonyms of *I. exigua*, Lam.

Genus RECLUZIA, Petit, 1853.

R. JOHNII, Chemn. Pl. 10, fig. 24.

Rather thin, shining, transparent, with fine, slightly undulated spiral striæ, periphery obtusely angulated and grooved; whitish, with very light bluish violaceous maculations. Length, 23 mill. *Indian Ocean.*

We have no satisfactory account of this species.

R. HARGRAVESII, Cox. Pl. 10, fig. 23.

Thin, olivaceous horn-color, very indistinctly banded, spirally obsoletely striated. Length, 38 mill. *Port Stephens, N. S. Wales.*

Very probably identical with the preceding species.

R. ROLLANDIANA, Recluz. Pl. 10, figs. 25–27.

Rather thin, olivaceous brown, with irregular, subundulating spiral striæ. Length, 23 mill. *Mazatlan? New Caledonia.*

R. Montrouzieri, Souverb. (fig. 27), appears to be a synonym.

Var. ANNAMITICA, Wattebled. Fig. 26.

Shell more depressed and more inflated, rarely with darker bands; peristome sinuous, columella twisted a little. Length, 25 mill. *Annam.*

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R. JEHENNEI, Petit. Pl. 10, fig. 28.

Subperforate, whorls rapidly enlarging and very convex, with deep suture, obsoletely spirally striated, light olivaceous brown. Length, 19 mill.

Arabian Gulf.

Differs from the last species in being shorter and more convex, and from its variety mainly in the more regularly rounded aperture; it is possibly the same species, however.

R. GLOBOSA, E. A. Smith. Pl. 10, fig. 29.

Thin, imperforate, whitish, strigate with light brown, with incremental striæ, more distinct and scale-like at the suture, and slight, smooth, spiral sculpture. Length, 11·5 mill.

Solomon Islands.

Its pertinence to the genus is somewhat doubtful; it was described from a specimen denuded of epidermis.

Unfigured Species.

R. TURRITA, Busch. *Hab. unknown.*

R. ERYTHRÆA, Jickeli. *Red Sea.*

R. BENSONI, A. Ad. *China Sea, off Formosa.*

R. APERTA, Jeffreys. = *Torellia vestita*, Jeffreys.

Family *TRICHOTROPIDÆ*.

Shell thin, turbinated, carinated, the ridges bearing epidermal fringes in fresh or living specimens, umbilicated; aperture angulated or subchanneled below, lip sharp, columella obliquely truncated, operculum generally lamellar, with apical nucleus. (Pl. 10, fig. 38).

Animal with a short, broad head; tentacles somewhat distant, with eyes about their middle; foot elongated; siphon very short, but evident.

Central tooth of the radula subquadrangular, multicuspid, lateral large, transverse with finely crenulated margin, two marginal teeth on either side, curved, sharp, simple (2·1·1·1·2). Pl. 7, fig. 37.

Genus TRICHOTROPIS, Brod. and Sowb., 1829.

Characters those of the family. There are about 15 species, inhabiting Arctic seas. Fossil, in the English Crag.

Trichophora, Desh., 1830, is a synonym. The name signifies "hairy keel."

The following sections of Trichotropis have been proposed: they have little value:—

Section Trichotropis (sensu stricto). T. bicarinata, Sowb.

Section Ariadna, Fischer, 1864.

Shell without epidermal fringes. T. borealis, Brod. and Sowb.

Has the epidermal fringes in fresh specimens.

Verena, Gray, 1857 (not H. and A. Adams, 1854), is a synonym.

Section Iphinoë, H. and A. Adams, 1854.

Shell widely umbilicated, aperture subtriangular. T. unicarinata, Sowb.

The width of the umbilicus varies in the species, so that the group is unimportant in its characters.

Subgenus Alora, H. Adams, 1861.

Shell ovate-fusiform, slightly umbilicated, thin; spire elevated; whorls convex, cancellated with elevated spiral ribs and longi-

tudinal lamellæ; aperture oval, slightly produced in front, inner lip smooth, rounded, slightly reflexed in front, outer lip simple, acute. T. GOULDII, A. Ad., *W. Coast Central Am.*

Subgenus GYROTROPSIS, Gabb, 1876.

Shell thin, spire elevated, umbilicus wide, funnel-shaped, last whorl angulated above and below the periphery, and covered with very thin foliated longitudinal varices. T. SQUAMOSA, Gabb. Cretaceous, *N. Carolina* (Pl. 7, fig. 39).

? Genus SEPARATISTA, Gray, 1847.

Shell subdiscoidal, with very short spire, the last whorl separated from its predecessors, forming a very large umbilicus; aperture slightly channeled at the base. This group, which I formerly included in Muricidæ (see Manual, ii, p. 213), is doubtfully referred to Trichotropidæ by Dr. Fischer and others.

Genus TORELLIA, Lovén, in Jeffreys, 1867.

Shell narrowly perforated, globular, covered by a pilose epidermis; spire short, depressed; mouth rounded, with a hardly perceptible basal sinus; lip thin, curved; columella concave, subtruncated at the base.

Differs from Trichotropis in being holostomate and subglobose. *Trachyoma*, Seguenza, is a synonym. T. VESTITA, Jeffreys. *Arctic Seas.*

Genus SEGUENZIA, Jeffreys, 1876.

Shell thin, turbinate or subtrochoid, translucent, the outer layer very slight, somewhat nacreous in fresh specimens, with spiral carinations; aperture irregular, sinuous behind, columella twisted, base with a sinus. Operculum thin, oval, with subcentral nucleus, and with obsolete, numerous concentric lines (Pl. 7, fig. 41). Radula (Pl. 7, fig. 40).

The position of this group of deep-sea minute shells is not well ascertained. The soft parts have not been described. Verrill, who obtained the dentition, formed for the species a family, which he located near Chenopus; Dr. Jeffreys places them near Solariidæ and Dr. Watson in Trochidæ (on account of the operculum and slight pearly layer of the shell). I place the group here, for the present.

Læocochlis, Dunker and Metzger, has been referred to Trichotropidæ by Dr. von Martens. I shall include it in my monograph of the family Cerithiidæ.

Trichotropis has been monographed by:

Sowerby, Thes. Conchyl., iii, 321. 12 species.

Sowerby, Conch. Icon., xix, 13 sp., 1874.

Genus TRICHOTROPIS, Brod. et Sowb., 1829.

T. BICARINATA, Brod. and Sowb. Pl. 7, figs. 42, 43.

Rather thin, whorls few, the last very large, encircled by two distant ciliated keels; umbilicus rather large, with ciliated margin; epidermis yellowish brown. Length, 1·5 inches.

Japan, Alaska, Grinnell Land.

T. Sowerbyanus, Lesson, is a synonym, and *T. tenuis*, E. A. Smith (fig. 43), is a monstrosity.

Var. ALTA, Dall.

Whorls 4, with more elevated spire, aperture narrower and smaller, umbilical excavation much narrower and smaller; solid and strong.

Plover Bay, E. Siberia.

Var. SPECTABILIS, Dall.

Whorls 5, with elevated spire; columella narrow, waved, not truncate, straight, not arched as in the two preceding forms, its outer edge strongly elevated; umbilicus a mere groove; whorls much flatter above and below, the last wide out of proportion to the spire, the second carina apparent on all the whorls; aperture sharply pointed below, painted with sea-green within and on the columella.

Near *Plover Bay, E. Siberia.*

T. BOREALIS, Brod. and Sowb. Pl. 7, figs. 44–48, 52, 59.

Umbilicated; whorls few, shouldered, and spirally keeled, the last with two to five strong keels, varying in development; covered with a yellowish brown epidermis, hairy on the ridges, aperture often pink within. Length, 1 inch.

Northern Europe, Greenland to *Massachusetts, Arctic America, Japan.*

There are a number of synonyms, partly in consequence of the great variation in the development of the keels, much

affecting the contour and general appearance. I include here: *T. Atlantica*, Beck; *T. acuminata*, Jeffreys; *T. costellata*, Couth. (fig. 48); *T. inermis*, Hinds (fig. 52); *Fusus Laskeyi*, Macgill.; *Fusus umbilicatus*, Brown; *T. conica*, Möll. (fig. 45); *T. quadricarinata*, A. Ad. (fig. 44), from Japan; *T. insignis*, Midd., var. of Aurivillius (fig. 59).

T. CLATHRATA, A. Ad. Pl. 7, fig. 51.

Umbilicus narrow, whorls angular, carinated above, cancellated with slightly beaded spiral ribs and interstitial regular, small, longitudinal riblets; epidermis thin, yellowish brown.

New Zealand.

T. inornata, Hutton, is a synonym. I have not seen this species, which so greatly resembles *T. borealis*, but is from an entirely different locality. The figure shows no trace of hairs on the epidermis.

T. CANCELLATA, Hinds. Pl. 7, figs. 49, 50.

Umbilicus small, whorls about 7, well rounded, with elevated spire, with a number of spiral ribs, obsoletely cancellated here and there by distant longitudinal and less prominent ribs; epidermis light brownish or grayish; aperture often pink.

Length, 1–1·4 inches.

Alaska to Vancouver's Island.

Appears to be peculiar to the west coast of North America, where it replaces *T. borealis*. Jeffreys considers it identical with that species, and as Arctic mollusca are exceedingly variable, this may be so; yet I find no conclusive evidence of it. *T. flavida*, Hinds (fig. 50), belongs here.

T. CORONATA, Gould. Pl. 7, figs. 53, 54.

Umbilicus rather wide and deep, acutely margined; whorls about 6, tabulate and carinate at the angle; epidermis ash-colored, fibrously produced at the angle. Length, 25 mill.

Sts. of Semiavine, Arctic Ocean; Behring's Sea.

The first figure given above is supposed by Krause, who publishes it, to represent the species, but it does not appear to me to agree with the description. Gould never figured it. I have added a figure given by Aurivillius, which is probably a better representation of it, and approaches *T. unicarinata*.

T. UNICARINATA, Brod. and Brod. Pl. 7, fig. 56.

Whorls tabulately shouldered, with a single beaded keel at the angle; umbilicus wide, surrounded by a keel, rest of surface smooth; pinkish, covered by a brown epidermis.

Length, 20 mill.

Japan.

T. CEDO–NULLI, A. Ad. Pl. 7, fig, 55.

Spire elevated, whorls rounded, umbilicus minute or imperforate, cancellated by spiral beaded ribs and longitudinal riblets, columella truncate and a little turned back at the base, epidermis reddish brown. Length, 12 mill.

Japan.

T. FIMBRIATA, Jeffreys. Pl. 7, fig. 57.

Thin, semitransparent, imperforate; whorls 4–5, with spiral ciliated riblets, of which there are 8–10 on the body-whorl; columella straight. Length, 2·5 mill.

Atlantic (Porcupine Exped.).

Evidently a very young shell.

T. DENSISTRIATA, Jeffreys. Pl. 7, fig. 58.

Thin, semitransparent, imperforate; whorls 3–4, rather tumid, with numerous spiral striæ, which are covered by minute, close-set prickles, body-whorl with a shallow peripheral sulcus; columella straight, truncate below. Length, 2 mill.

Cape Verd I.; 1192 fms.

This, like the last, is a very young shell.

T. KROYERI, Phil. Pl. 8, figs. 61, 60, 62–64.

Shell thick, widely umbilicated; whorls 5, with distant spiral ribs; umbilicus encircled by a rib; epidermis yellowish brown.

Length, 1·5 inches.

Spitzbergen, Behring's Strait.

The synonyms are *T. Kuzeri*, Phil., and *T. Ruzeri*, Phil., of Reeve and Brazier respectively, both misprints; *T. ciliata*, Kroyer; *T. dolium*, Petit; *T. arctica*, Midd. (figs. 62, 63). Aurivillius has figured an immense specimen of this species (fig. 60), and another, with a tubercle near the base of the columella (fig. 64), which he has distinguished as *T. solida.*

T. INSIGNIS, Middendorff. Pl. 8, fig. 88; ? Pl. 7, fig. 59.

Umbilicus small, shell thick, somewhat globose, with undulating crenulated spiral ribs, two of them usually more prominent, angulating the body-whorl, aperture margin often crenulated, epidermis light yellowish brown. Length, 18 mill.

Behring's Straits.

The second figure is referred to this species as a lengthened variety by Aurivillius; it appears to me more like a variety of *T. borealis.*

Unfigured Species.

T. MIGRANS, Dall. Near *Havana, Cuba.*

Remarkable as the first species of the genus found in tropical waters.

T. PUSILLA, Gould. (= Fossarus).

T. PERAMABILIS, Dall. *Sitka.*

T. INFLATA, Friele. *North Sea.*

T. ELLIPSOIDEA, Gould. *Hong Kong Bay.*

T. d'ORBIGNYANUM, Petit. (= Coralliophila, Manual, ii, 206).

T. TRICARINATA, and T. GRACILENTA, Brazier. *N. Australia.*

T. (ALORA) GOULDII, A. Ad. *Panama.*

Genus SEPARATISTA, Gray, 1847.

S. BLAINVILLEANA, Petit. Pl. 8, fig. 69.

Widely umbilicated, membranaceous, pellucid, under a roseate corneous epidermis; whorls 6, rapidly increasing, broadly tabulate, periphery with two spiral distant ribs on the spire, and three on the body-whorl; aperture transverse, a little channeled below. Diam. 10 mill.

? Marianne Is.

S. CHEMNITZII, A. Ad. Pl. 8, fig. 70.

Spire more depressed than the preceding species, with fewer whorls, which are convex, the three peripheral keels closer and not so prominent as in the last species. Diam. 18 mill.

Philippines.

S. GRAYI, A. Ad.

Spire depressed; whorls with five keels; aperture transversely oblong; inner lip reflexed, anteriorly rounded. Unfigured.

Cape of Good Hope.

Genus TORELLIA, Lovén, 1867.

T. VESTITA, Jeffreys. Pl. 8, fig. 66.

Narrowly umbilicated, subglobose, rather thin, semitransparent, chalky white, under a pale yellowish brown, velvety epidermis; whorls 5–6, tumid, rapidly enlarging, with numerous fine spiral and less conspicuous longitudinal striæ; aperture nearly entire, round. Diam. 15 mill.

Norway, *Shetland*, *Martha's Vineyard*, etc.

First described by Jeffreys as *Recluzia aperta*.

T. DELICATA, Phil. Pl. 8, fig. 67.

Narrowly umbilicated, very thin; whorls 6, well-rounded, with deep suture, very finely reticulated by longitudinal and spiral striæ.

Messina, *Sicily*.

T. FIMBRIATA, Verrill and Smith. Pl. 8, fig. 68.

Narrowly umbilicated, thin, fragile, suture deep; whorls 5, very convex, rapidly enlarging, with spiral, hairy carinæ, about ten of them on the last whorl, the interspaces finely, nodulously reticulated by growth and spiral lines; columella callously thickened below. Diam. 17 mill.

Off Martha's Vineyard, *Mass.*

Var. TIARELLA, Verrill.

Subsutural carina well developed and hairy, the other carinæ nearly obsolete.

Genus SEGUENZIA, Jeffreys, 1876.

S. MONOCINGULATA, Seguenza. Pl. 8, figs. 71–73.

Imperforate; whorls with revolving ribs, of which the last has about four distant prominent ones, besides minor striæ on the base; white. Length, 6 mill.

N. Atlantic, *New England*, *Bay of Biscay*, *S. W. of Bermudas*, *Gulf of Mexico*.

S. formosa, Jeffreys, is a synonym.

Var. LINEATA, Watson. Figs. 72, 73.

Same localities as the type.

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Var. NITIDA, Verrill.

Thinner, more translucent, with less acute spire, and more delicate sculpture, the spiral lines on the base more numerous and closer.

S. ERITIMA, Verrill. Pl. 8, fig. 74.

Sculpture more delicate, carinæ less acute, riblets finer and closer, basal lines finer and more numerous than in the preceding species; it is also narrowly umbilicated. Length, 4·5 mill.

Off *New England*, 1290, 1467 and 2033 fms.

S. ELEGANS, Jeffreys. Pl. 8, fig. 75.

Umbilicated, shorter, more globose than *S. eritima*, lip fissure close to the suture, columella produced below, aperture broadly truncately sinuous on the base. Length, 3 mill.

Bay of Biscay.

S. TRICARINATA, Jeffreys. Pl. 8, fig. 76.

Umbilicus narrow, slightly keel-margined; depressed-globose, convexly shouldered above, then three-keeled; lip fissure wide and shallow, aperture narrowly produced at the base; white. Length 2 mill.

Off *Cape Verd Is.;* 1192 fms.

Not adult.

S. IONICA, Watson. Pl. 8, figs. 77, 78.

Umbilicated, depressed trochiform, with two strong spiral ridges and a number of basal striæ—most distinct around the outer margin, and surrounding the umbilicus. Diam. 6 mill.

W. of Azores; West Indies.

S. TRISPINOSA, Watson. Pl. 8, figs. 79, 80.

Umbilicated, elevated trochiform, suture deep, with three rather close tubercular spiral ridges, base with numerous spiral striæ, the outer one much more distinct. Diam. 3·75 mill.

Pernambuco.

S CARINATA, Jeffreys. Pl. 8, figs. 81–83.

Umbilicated, rather smooth, with a single peripheral carina, showing at the base of the spire-whorls, base nearly smooth. Diam. 4 mill.

N. Atlantic, Bay of Biscay, Canaries, Azores, Pernambuco.

S. RETICULATA, Phil. Pl. 8, figs. 84, 85.

Umbilicated, trochiform, periphery acutely angulated, elegantly granularly reticulated, base smooth, obsoletely cingulated at the periphery. Diam. 2·5 mill.

Portugal; off *Ascension I.; West Indies.*

Fossil, pliocene of Calabria.

It is *Trochus* (*Solariella*) *Lusitanica*, Fischer.

S. LAXA, Jeffreys. Pl. 8, figs. 86, 87.

Shell consisting of scarcely two whorls, which are cylindrical and scalariform, regularly spirally striated; mouth nearly detached, quadrangular, a little produced at the base; umbilicus narrow and deep. Length, 6 mill.

Atlantic (Porcupine Exped.).

Only a fragment obtained. Its generic position is very doubtful.

S. DELICATULA, Dall. (unfigured). *Gulf of Mexico.*

Family *SCALARIIDÆ.*

Animal having a retractile proboscis; tentacles close together, long and pointed, the eyes on slight elevations near their outer bases; mantle-margin simple, with a rudimentary siphonal fold; foot truncated in front, extending far in advance of the head. Jaws oval or semicircular, spiny, or denticulated only on the margin; radula composed of elongated unciform or aciculated teeth, many in a series (Pl. 11, fig. 30). Sexes distinct.

Shell usually white and polished, turriculated, perforate, but the umbilicus frequently covered by an expansion of the inner lip-margin; whorls numerous, convex, usually loosely coiled, often barely or not at all in contact; aperture entire, circular or oval. Operculum corneous, few-whorled, nucleus nearly central.

These mollusks are somewhat closely allied to the Ianthinæ, of which they may be regarded as creeping representatives. The form of the shell remotely suggests Turritella.

Synopsis of Genera.

Genus SCALARIA, Lam., 1801.

Shell mostly pure white and lustrous, umbilicated or imperforate; spire elongated, the apex more or less inflected; whorls numerous, rounded, in contact or separated, ornamented with longitudinal ribs or thin lamellæ, often continuous across the suture; peristome entire, thickened, reflected. Animal as in the family description. They are predaceous. Dr. Gould fed them on raw beef, which they eat voraciously. They exude a purple fluid when irritated.

The genus commenced in the Trias, and has continued its development to the present time; about 200 fossil species have been described, and not far from the same number recent. They are found from low water to 80 or 100 fathoms and occur throughout the world, the Arctic seas furnishing representations of peculiar type; but the largest, finest and most typical species

are tropical. The West Indian province appears to be the metropolis of the genus; at least more species have been described from that than from any other region. The name indicates a fancied resemblance to a ladder; in the vernacular the shell is usually known as "Wentle-trap." The synonyms include *Scala*, Klein, 1753; *Cyclostoma*, Lam., 1799, and *Sthenorytis*, 1868; *Compsopleura* and *Scalina*, 1865, by Conrad, the three last proposed (but not described) for American tertiary fossils.

A number of genera and subgenera have been described, based upon characters of secondary importance, and which can be mostly advantageously reduced to the rank of sections.

Section SCALARIA (*sensu stricto*).

Whorls a little separated, crossed by regular lamelliform varices, umbilicated. *Aciona*, Leach, 1815, is a synonym.

Section CLATHRUS, Oken, 1815.

Shell moderately thick, often colored, whorls united, longitudinal ribs usually numerous, aperture suboval, umbilicus covered by the left lip, no basal rib. *Janthoscala* and *Turbona* (Brown), Mörch, 1876, published without diagnosis, appear to include species of this section.

Section OPALIA, H. and A. Adams, 1853.

Shell turriculated, imperforate, whorls united, the last with a basal spiral rib. To this group may be referred *Psychrosoma*, Canefri, 1876, and perhaps *Compsopleura* (Am. tertiary), Conrad, 1865.

Section AMÆA, H. and A. Adams, 1853.

Shell turriculated, thin, whorls united, cancellated, with some thin, irregular varices; aperture semilunar, inner lip gibbous in the middle, outer lip thin, simple.

Section CIRSOTREMA, Mörch, 1852.

Shell turriculated, solid, whorls cancellated, with a few irregular, thick, crispate varices; aperture bordered by a thick crenulated varix.

Section ACIRSA, Mörch, 1857.

Shell turreted, thin, whorls united, varices obsolete; lip thin, simple. *Arctic Seas.*

Section ACRILLA, H. Adams, 1860.

Shell moderately thick, turritelliform; whorls united, with very numerous filiform ribs, last whorl with subcarinated periphery; lip of aperture thin.

Subgenus CONSTANTIA, A. Adams, 1860.

Shell small, perforate or imperforate, oval, with elate spire; whorls rounded, decussated by thin longitudinal plications and revolving elevated liræ; aperture oval, margin free, continuous, acute.

Subgenus CROSSEIA, A. Adams, 1865.

Shell turbinate, umbilicated, white; whorls convex, in contact, cancellated, simple or with distant varices; aperture somewhat produced and channeled in front; umbilicus surrounded and restricted by a callus. *Japan.*

Genus SCALIOLA, A. Adams, 1860.

Shell turriculated, whorls in contact, without varices, agglutinating to the surface minute particles of sand, etc. Animal with elongated, cylindrical, annulated rostrum, eyes prominent, black, foot short, oval, acuminated behind. Operculum corneous, oval, subspiral, with subterminal nucleus. *Japan.*

Genus FUNIS, Seeley, 1861.

Shell turreted, thin; whorls with lamelliform ribs, and usually also with spiral striæ, so as to produce a cancellated surface; aperture ovate, margin thin, produced below. Characters intermediate between Scalaria and Turritella.

F. ELONGATA, Seely. Fossil in the Cambridge Greensand, *England* (Struct. and Syst. Conch., t. 67, f. 46).

Genus EGLISIA, Gray, 1840.

Shell imperforate, elongated, solid; whorls numerous, rounded, spirally grooved, with indications of longitudinal varices; aperture small, orbicular, columellar lip curved, thick, flattened and

angulated in front, umbilical region filled by a twisted funiculum. Operculum corneous, few-whorled, with subcentral nucleus.

Europe, West Coast of Africa, West Indies, Indian Ocean, Japan.

Smithia, Maltzan, 1883, is a synonym.

This genus has usually been arranged with the family Turritellidæ.

Genus ACLIS, Lovén, 1846.

Animal with long, retractile proboscis, tentacles close together at the base, slender, cylindrical, eyes sessile at their external bases; foot truncate; mentum narrower than the sole, and extending far beyond the head; operculigerous lobe ample, unsymmetrical. Radula of numerous, simple, aculeiform teeth. Shell narrowly umbilicated or rimate, small, turreted, subulate, smooth, or usually with spiral riblets; aperture oval, entire, the peristome not continuous, lip thin, simple. Operculum corneous, thin, ear-shaped, paucispiral, with marginal nucleus.

Aclis resembles Turritella in form, but is much smaller and umbilicated. A few living forms are found in European seas, and a dozen fossil species, commencing with the Devonian, are also referred to the genus.

Ebala (Leach), Gray, is a synonym.

Section ACLIS (*sensu stricto*).

Shell spirally sulcate.

Section HEMIACLIS, Sars., 1878.

Shell smooth, spire elongated, a little conical, apex regular, obtuse; base a little dilated, aperture rather large.

Section GRAPHIS, Jeffreys, 1867.

Cylindrical, longitudinally striated or reticulated; spire elongated, apex obtuse and twisted; aperture oval, contracted. *Cioniscus*, Jeffreys, 1869, is a synonym; the earlier name was unnecessarily changed on account of being preoccupied in lichens.

Section PHERUSA, Jeffreys, 1869.

Shell subcylindrical, smooth, subperforate; apex obtuse, twisted, but not sinistral; aperture angulated at the base, lip

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sharp, sinuous. *Menippe*, Jeffreys, 1867, is a synonym, preoccupied in Crustacea.

Section IOLÆA, A. Adams, 1860.

Shell umbilicated, turriculated or subulate; whorls slightly convex, spirally sulcate, with fine longitudinal striæ in the interstices; aperture oblong, acuminated behind, rounded in front, lip free, simple.

Section ACTÆONEMA, Conrad, 1865.

Shell slightly umbilicated, conical; whorls numerous; aperture suboval, rounded and reflected at the base, lip not continuous, sharp. *Cælatura*, Conrad, 1865, is a synonym.

A. STRIATUM, Lea. Eocene of Alabama.

Genus STILBE, Jeffreys, 1884.

Shell conical, elongated, smooth, shining, apex regular and sharp; whorls numerous, but slightly convex; aperture suboval, angulated in front and behind, lip sharp. *Atlantic Ocean;* abyssal.

Jeffreys has placed this group in Turritellidæ; it appears to be more nearly related to Aclis.

Genus HOLOPELLA, M'Coy, 1852.

Shell elongated, slender, of numerous gradually increasing convex whorls, with deep suture, usually arcuately striate, or smooth, sometimes reticulated; aperture circular, with continuous peristome; base rounded, with or without a minute umbilicus

Silurian-Triassic. H. GREGARIA, Sowb.

About a dozen species are known. *Aclisina*, de Koninck, 1881, is a synonym.

? Genus ELASMONEMA, Fischer, 1885.

Shell sometimes elongated, sometimes short or globular, with rather distant, sublamellar longitudinal striæ; whorls convex; mouth circular, lip continuous, thin.

Silurian. E. SCALARIFORME, Lindström.

The name is proposed instead of *Callonema*, Hall, 1879, not Conrad, 1873; but if the latter is really, as suspected, a synonym of *Spironema*, Meek, 1864, Hall's name might be retained.

Scalaria has been monographed by:

Kiener, Iconog. Coq. vivantes. 20 species. (No date.)

Sowerby, Thesaurus Conchyliorum, i. 93 species. 1847.

Sowerby, in Reeve's Conch. Icon., xix. 125 species. 1874.

Besides these, Mörch has published in the Journal of the Philadelphia Academy, viii, 1876, an important paper on the West Indian species, based principally on the study of the specimens belonging to the Robert Swift collection, in the museum of that institution.

An alphabetical catalogue of the recent and fossil species of Scalaria, published by H. P. Nyst in the Annales de la Soc. Malacol. de Belg., vi, 1873, includes 162 living, 161 tertiary, 51 cretaceous and 4 jurassic species.

Genus SCALARIA, Lam., 1801.

Section SCALARIA (*sensu stricto*).

S. PRETIOSA, Lam. Pl. 11, fig. 31.

Widely umbilicated, smooth, polished, usually fleshy white, the ribs ivory-white; whorls 8, rounded. Length, 2·5 inches.

China, *Australia*, *Moluccas*.

This is the well-known "precious wentletrap," the *Turbo scalaris*, of Linnæus.

S. CRENULATA, Pease. Pl. 11, fig. 32.

Umbilicated, smooth, white; whorls 4, separated by a deep, wide suture; lamellæ 6, crenulated on the edge. Length, 5 mill.

Tahiti.

At first sight appears like a diminutive *S. pretiosa*, but is wider, with less numerous, crenulated varices.

S. PALLASI, Kiener. Pl. 11, fig. 33.

Shell narrower than *S. pretiosa*, with narrower umbilicus, fleshy white between the ribs; whorls 8, somewhat disunited, lamellæ more numerous than in *S. pretiosa*, usually slightly hooked at the top of the whorls. Length, 1·5 inches.

China, *Philippines*, *Mauritius*.

The synonyms are *S. neglecta*, Reeve (not Adams and Reeve); *S. subpretiosa*, Blainv.; *S. notha*, Menke, and *S. Nicobarica*, Beck, MS.

S. NEGLECTA, Ads. and Reeve. Pl. 11, figs. 34, 35.

Umbilicated, pale fawn-color, the ribs white; whorls 7–8, rounded, rather numerously lamellate, the lamellæ uncinated at the top of the ribs. Length, 1·25 inches.

China Sea.

S. inclyta, Melvill (fig. 35), appears to me to be an old, well-grown specimen of this form; the author distinguished it from *S. neglecta*, but apparently has taken Reeve's incorrect identification of that species (see preceding description).

S. IMPERIALIS, Sowb. Pl. 11, fig. 36.

Narrowly umbilicated, fawn-color between the white lamellæ, which are numerous and rather close; whorls about 8, well rounded, rapidly increasing. Length, 1·25 inches.

Mozambique; Swan River, Australia.

S. BULLATA, Sowb. Pl. 11, fig. 37.

Narrowly umbilicated, short and broad, very ventricose; whorls 6, very rapidly increasing, with oblique lamellæ, somewhat uncinate at the suture. Length, 20 mill.

Ins. Capul, Philippines.

S. OBESA, Sowb. Pl. 11, figs. 38, 39.

Whorls 6, ventricose, rather solid, contiguous, with numerous, thick, rounded lamellæ; margin of aperture usually fulvous. Length, 16 mill.

Australia.

S. ALATA, Sowb. Pl. 11, fig. 40.

Narrowly umbilicated, white, often broadly diffusely banded with fawn-color; whorls 7, not in contact, with distant, thin lamellæ, angulated above, with somewhat pointed angle. Length, ·5–·75 inch.

Singapore, Philippines, Viti Is.

S. FASCIATA, Sowb. Pl. 11, fig. 41.

Umbilicus nearly covered, white, single-banded with brown between the varices; whorls 7, rounded, hardly touching, lamellæ acuminately angled above. Length, 23 mill.

Ins. Luzon, Philippines.

S. MARMORATA, Sowb. Pl. 11, fig. 42.

Scarcely umbilicated, marbled with brownish between the lamellæ; whorls 8–9, obtusely angulated above, the varices also angulated, narrow and thin. Length, 1 inch.

India.

Differs from the preceding species by its more numerous, angulated whorls, thinner and more irregular varices, and coloring.

S. REPLICATA, Sowb. Pl. 11, fig. 43.

Scarcely perforate, stout, white; whorls 6, a little disunited, lamellæ rather distant, recurved, uncinate near the suture. Length, 19 mill.

Lord Hood's Isl.; Kingsmill Is.

S. TENUICOSTATA, Sowb. Pl. 11, fig. 44.

Almost imperforate, thin, subventricose; whorls 8, with thin lamellæ, uncinate above. Length, 20 mill.

Ins. Luzon, Philippines.

S. CLEMENTINA, Grateloup. Pl. 11, figs. 48, 47.

Narrowly umbilicated, short, ventricose, fawn color, with three narrow chestnut bands, lamellæ white; whorls 6, rounded, lamellæ numerous, unequal. Length, 19 mill.

Singapore; Philippines.

S. trifasciata, De Haan (fig. 47), is a synonym. The bands are sometimes faint or obsolete.

S. LATIFASCIATA, Sowb. Pl. 11, figs. 45, 46.

Spire longer than in the preceding species, with broad chestnut bands. Length, 23 mill.

Mauritius.

S. BULBULUS, Sowb. Pl. 11, fig. 49.

Subimperforate, short, ventricose, fawn color; whorls 5, rounded, contiguous, with rather distant, slightly arched, rounded, white lamellæ. Length, 13 mill.

Hab. unknown.

S. OPTABILIS, A. Ad. Pl. 11, fig. 50.

Subimperforate, short, ventricose, whitish, interruptedly two-banded, appearing like two rows of spots; whorls 6, the lamellæ rounded, equal, rather distant. Length, 12 mill.

Hab. unknown.

S. TENUILIRATA, Sowb. Pl. 11, fig. 51.

Perforate, purple brown between the varices; whorls 6, rounded, rapidly increasing, with deep suture, lamellæ very close, unequal, thin, rounded, reflected. Length, 12 mill.

Japan.

S. LAXATA, Sowb. Pl. 11, fig. 52.

Narrowly umbilicated, thin, smooth, white; whorls 6, much disunited, with numerous, thin, scarcely regular lamellæ. Length, 20 mill.

Ins. Luzon, Philippines.

S. HYALINA, Sowb. Pl. 11, figs. 53, 54.

Widely umbilicated, solute, smooth, thin, pellucid, white; whorls 6, with distant, crenulated varices. Length, 18 mill.

Ins. Luzon, Philippines; Singapore.

S. SOLUTA, Dunker. Pl. 11, fig. 55.

Umbilicated, white; whorls 5, well rounded, disunited, with about ten crenulated white lamellæ, usually four-lobed in the last whorl. Length, 5 mill.

St. Thomas, West Indies.

S. SEMIDISJUNCTA, Jeffreys. Pl. 11, fig. 56.

Subimperforate, corkscrew-shaped, white; whorls 7–8, flat-shouldered, with close-set, flexuous, sharp lamellæ, the interstices very finely spirally striated. Length, 12·5 mill.

Azores, 2199 fms.

S. VERMETIFORMIS, Watson. Pl. 18, fig. 74.

Solute, thin, white; whorls 6, rounded, with numerous low, fine, sinuous lamellæ, and fine spiral lines. Length, 6 mill.

Off *Pernambuco* (350 fms.).

S. PRINCIPALIS, Pallas. Pl. 12, fig. 58.

Narrowly umbilicated, thick, white, irregularly spirally striated; whorls 8–10, well rounded, scarcely in contact, with rather numerous, low lamellæ. Length, 1·75 inches.

Tortola, W. Indies.

S. COSTULATA, Kiener. Pl. 12, fig. 59.

Narrower, with more numerous, lower lamellæ than the preceding species, but possibly only a variety. Length, 34 mill.

W. Columbia (Cuming).

S. STATUMINATA, Sowb. Pl. 12, fig. 60.

Narrowly perforated, short, thick, whitish; whorls 8, round-shouldered, with few, thick, obliquely continuous varices.

Length, 15 mill.

Payta, Peru.

S. OBTUSA, Sowb. Pl. 12, fig. 61.

Subimperforate, rather ventricose, white; whorls 6–7, convex, contiguous, with rather numerous, thin lamellæ, obtusely angular above. Length, 18 mill.

St. Elena, W. Co. Central America.

S. KREBSII, Mörch. Pl. 12, figs. 62, 63.

Narrowly umbilicated, polished, irregularly spirally striated, white, light fulvous about the middle of the whorls; whorls 5–6, scarcely joined, convex, slightly plane above, lamellæ ten, a little uncinate at the suture. Length, 17 mill.

St. Thomas and St. Martin, W. Indies.

S. SWIFTII, Mörch. Pl. 12, fig. 64.

Scarcely perforate, white, polished, with very obsolete spiral striæ; whorls 7–8, with rimate suture, lamellæ about twelve, subcontinuous, not produced above. Length, 14 mill.

St. Thomas, W. I.

S. INCONSPICUA, Sowb. Pl. 12, fig. 65.

Narrowly umbilicated, ventricose, short, white; whorls 6, well rounded, with numerous, close, very thin lamellæ.

Length, 13 mill.

West Indies.

Mörch indicates a var. INFLATA. L. 9, lat. 5·5 mill.

S. NANA, Jeffreys. Pl. 12, fig. 66.

Narrowly umbilicated, semitransparent, not glossy, whitish, with a few spiral striæ; whorls 7–8, convex, with about thirty close lamellæ. Length, 3·75 mill.

Bay of Biscay.

S. BREVIS, d'Orbigny. Pl. 13, fig. 4.

Widely umbilicated, thin, whitish; whorls 4, obtusely angulated on the periphery, spirally striate, with narrow, distant, low lamellæ. Length, 1 mill.

Falkland Is.

Evidently a very young shell.

S. CRASSA, Sowb. Pl. 11, fig. 57,

Slightly umbilicated, white, smooth; whorls 6, well rounded, slowly increasing, with rather numerous, thin, low varices.
Length, 22 mill. *Philippines.*

S. LYRA, Sowb. Pl. 12, fig. 69.

Narrowly umbilicated, whitish, with close, very thin lamellæ, white, two- or three-banded with chestnut; whorls 7, rounded, contiguous. Length, 22 mill.
Japan, *Philippines*, *Viti Is.*

Differs from *S. Clementina* and *S. latifasciata* by its thin, numerous lamellæ. *S. lineata*, Kiener (in part), is a synonym.

S. LINEOLATA, Sowb. Pl. 12, fig. 81.

Narrowly umbilicated, fulvous, two-banded with chestnut between the lamellæ; whorls 8, well rounded, with numerous, thin, rounded, white lamellæ. Length, 1 inch.
Philippines, *Japan.*

S. MARIEI, Crosse. Pl. 12, fig. 87.

Subimperforate, whitish, maculated with chestnut in about three spiral series; whorls about 7, separated, with very distant, low, small lamellæ. Length, 22 mill.
New Caledonia.

S. AURITA, Sowb. Pl. 12, fig. 84.

Narrowly perforate, pale fawn-color between the ribs, spirally two-banded with chestnut; whorls 8, well rounded, with thin, arched, rather distant decumbent varices, joined at the suture.
Length, 22 mill. *Coast of Coromandel; Japan.*
Narrower than the preceding species.

S. GLABRATA, Hinds. Pl. 12, fig. 85.

Narrowly perforate, yellowish with three interrupted series of chestnut maculations or bands between the lamellæ; whorls about 9, well rounded, with distant, white, continuous lamellæ.
Length, 20 mill. *Sts. Macassar; Malacca.*

S. MACULOSA, Ads. and Reeve. Pl. 12, fig. 86.

Narrowly perforate, yellowish with chestnut maculations between the varices; whorls about 9, with distant lamellæ, slightly angulated and aculeate above. Length, 10 mill.
China Sea.

S. RUBROLINEATA, Sowb. Pl. 12, figs. 82, 83.

Narrowly umbilicated, thin, yellowish white, two-banded with light chestnut, the upper band narrower and fainter, sometimes obsolete; whorls 5, well rounded, with rather numerous, thin, erect lamellæ. Length, 15–20 mill. *Australia, Philippines.*

S. DUBIA, Sowb. Pl. 12, figs. 67, 68.

Moderately umbilicated, white; whorls 9, well rounded, contiguous, with numerous thin, thread-like, low lamellæ and scarcely perceptible spiral striæ. Length, 1·5 inches.

Port Essington, Australia.

The original description was from a young specimen; the adult was described by Gray, three years subsequently, under the name of *S. striata* (fig. 68).

S. UNDULATISSIMA, Sowb. Pl. 12, fig. 70.

Perforate, thin, white, very minutely spirally striated, with close fine undulated lamellæ, a little aculeate at the top of the whorls; whorls 9, well rounded, slightly shouldered at the suture. Length, 1 inch. *Habitat unknown.*

S. IRREGULARIS, Sowb. Pl. 12, fig. 71.

Umbilicated, white, thin, with very thin, numerous irregular varices, a little aculeated above; whorls 6, well rounded, contiguous. Length, 22 mill. *Philippines.*

Very closely allied to *S. dubia;* the figure, however, represents closer, coarser lamellæ than in that species.

S. SIMILIS, Sowb. Pl. 12, fig. 72.

Narrowly umbilicated, thin, white, very minutely spirally striated; whorls 6, contiguous, lamellæ close and thin.

Length, 18 mill. *Philippines.*

S. SMITHII, Tryon. Pl. 12, fig. 73.

Fulvous grayish, very finely spirally striated; whorls 8, rounded, the last somewhat inflated, with close, thin lamellæ.

Length, 14 mill.

Whydah, W. Africa.

This species was described as *S. miranda*, E. A. Smith, and the name is changed on account of the previously published *Crosseia miranda*, A. Ad.

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S. CATANUANENSIS, Sowb. Pl. 12, fig. 74.

Shell ventricose, with seven rounded whorls, yellowish brown with very small, close, thin varices, and a conspicuous one on the back, near the aperture, minutely decussated by spiral striæ.

Length, 12 mill.

Catanuan, Philippines.

In Conchologia Iconica, the figures of this species and of *S. pulcherrima* have been transposed.

S. IMMACULATA, Sowb. Pl. 12, fig, 80.

Subumbilicated, minutely spirally striate, whitish; whorls about 9, rounded, contiguous, with rather numerous, very thin, unequal lamellæ, disappearing about the middle of the whorls, and crispate at the suture. Length, 1 inch.

Philippines.

S. FRIABILIS, Sowb. Pl. 12, fig. 75.

Scarcely umbilicated, very thin, white; whorls 8, but slightly convex, the suture not deeply impressed, with very thin, close lamellæ, aculeate close to the suture. Length, 20 mill.

Swan River, Australia.

S. CRISPATA, Pease. Pl. 12, fig. 79.

Subimperforate, thin, white, finely spirally striated; whorls 8–9, convex, contiguous, the last whorl slightly ventricose, with numerous, close, small, thin, crenulated lamellæ.

Length, 20 mill.

Paumotus Is.

S. INDISTINCTA, Sowb. Pl. 12, fig. 76.

Subimperforate, rather solid, white, minutely spirally striated; whorls 9, well rounded, with very fine close lamellæ, a little crispate at the suture. Length, 23 mill.

Gulf of California.

S. TENUISTRIATA, d'Orb. Pl. 14, fig. 52.

Subimperforate, thin, whitish; whorls 8, convex, subcancellated by very numerous close lamellæ and fine spiral striæ.

Length, 16 mill.

Bahia Blanca, Buenos Ayres.

S. TENERA, H. Adams. Pl. 12, fig. 77.

Subimperforate, thin, very finely spirally striated, white; whorls 9, well rounded, with numerous close, thin lamellæ, a little

crispate at the suture and almost disappearing on the middle of the whorls. Length, 7 mill.

Philippines.

Described by H. Adams as *S. delicatula*, a name preoccupied by Crosse and subsequently changed as above by Adams, and a year later to *S. subnudata*, by Sowerby.

S. Jeffreysii, Tryon. Pl. 12, fig. 78.

Slightly umbilicated, thin, semitransparent, glossy, whitish, with a few delicate, rounded, spiral striæ, more conspicuous towards the base of each whorl; whorls 10–12, convex, with moderate suture, with about 25–30 low, rounded riblets, inconspicuous or obsolete on the body-whorl. Length, 12 mill.

Atlantic O. (Porcupine Exped.).

Described by Dr. Jeffreys as *S. tenera*, preoccupied (see preceding species).

S. formosissima, Jeffreys. Pl. 17, fig. 34.

Narrowly umbilicated, very thin, nearly transparent, rather glossy, white; whorls 12, convex, narrowly, slopingly shouldered, with 40–50 crowded, slight riblets, closely decussated by thread-like spiral striæ. Length, 15 mill.

Azores.

S. pyramidalis, Sowb. Pl. 13, fig. 89.

Narrowly umbilicated; whorls 9, well rounded and scarcely in contact, with rather distant lamellæ, narrowly angulated and produced at the top of each whorl. Length, 1·25 inches.

Philippines.

Section Clathrus, Oken, 1815.

S. gradata, Hinds. Pl. 13, fig. 88.

Whorls 12, slowly increasing, narrow-shouldered above, lamellæ numerous, oblique, a little produced on the angle of the shoulder. Length, 1·5 inches.

Amboyna.

S. nodosa, Cpr. MS., in Brit. Mus., is a synonym.

S. Austro-Caledonica, Montr. Pl. 13, fig. 94.

Whorls thin, 8 or 9 in number, separate, joined by 7 strong lamellæ, which are shouldered and aculeate at the top of each whorl; white, with a single irregular chestnut band.

Length, 23 mill. *New Caledonia.*

S. ACULEATA, Sowb. Pl. 13, figs. 90, 91.

White, narrow, with eight contiguous whorls, and rather distant erect lamellæ, slightly produced and aculeated above, near the suture. Length, 15–18 mill.

Philippines, Hong Kong, Malacca.

S. EXIMIA, Ad. and Reeve. Pl. 13, fig. 92.

Pale fulvous, spirally striated; whorls 10, narrow-shouldered above, with regular white lamellæ; aculeate at the shoulder angle. Length, 8 mill.

China Sea.

S. PORRECTA, Hinds. Pl. 13, fig. 93.

Imperforate, yellowish brown, aperture yellowish; whorls 8, turreted, with numerous, rather thick lamellæ. Length, 10 mill.

Straits of Malacca.

S. MURICATA, Risso. Pl. 13, fig. 95.

Whorls 8, distinctly shouldered, the somewhat distant, rather broad lamellæ expanded and aculeate on the shoulder. Length, 18 mill.

Mediterranean Sea.

S. MITRÆFORMIS, Sowb. Pl. 13, fig. 1.

Similar to the preceding species, but with the lamellæ more numerous, narrower, and forming smaller, sharper points at the angle. Length, 18 mill.

Guacomayo, W. Coast of Cent. America.

S. FOLIACEICOSTA, d'Orb. Pl. 13, fig. 96.

Imperforate, somewhat solid, whitish, a little shining; whorls 11, almost distinct, with six or seven lamellæ, broadened above and aculeate. Length, 15 mill.

West Indies.

S. OCCIDENTALIS, Nyst. Pl. 13, fig. 97.

Thin, smooth, white; whorls 8–9, almost separate, with thirteen or fourteen oblique continuous lamellæ, excavated on the narrow shoulder and aculeate. Length, 13 mill.

West Indies.

The name is substituted for *S. tenuis*, Sowb. (non Gray).

Var. AURITA, Mörch.

Lamellæ eleven, thicker. Length, 11 mill.

A young shell.

Var. BLANDII, Mörch.

Perforate, the suture less open, lamellæ ten, with smaller and more numerous lobes.

S. CENTIQUADRA, Mörch. Pl. 13, figs. 99, 100.

Thin, white, decussated by fine growth-lines and spiral striæ, the latter usually alternating larger and smaller; whorls about 8, with ten or eleven subcontinuous lamellæ. Length, 15 mill.

West Indies.

It is *S. denticulata*, Sowb., not Mtg. (fig. 100).

S. VITTATA, Jeffreys. Pl. 13, fig. 3.

Thin, semitransparent, not glossy, pale yellowish brown, with three chestnut bands on the body-whorl, two on those of the spire; whorls 12–14, moderately convex, with deep suture, with about 15 sharp, rather low lamellæ, aculeate above.

Length, 12·5 mill. *Mediterranean Sea, W. Co. Africa.*

S. ALGERIANA, Weinkauff. Pl. 13, fig. 2.

White, turreted; whorls about 10, with slight spiral striæ, and fourteen lamellæ, narrowly shouldered and aculeate above.

Length, 6 mill. *Cape Breton; Mediterranean Sea.*

This is *S. coronata* and *S. Schultzii*, Weinkauff, and *S. multistriata*, Phil., not Say.

S. TURBINATA, Conrad. Pl. 13, fig. 8.

Imperforate, white, body-whorl dilated; whorls about 4, with strong lamellæ, terminating in a prominent angle above.

Length, 8 mill. Near *Beaufort, N. Carolina.*

S. POURTALESII, Verrill and Smith. Pl. 13, fig. 6.

Pure white, rather stout, with seven well rounded, scarcely united whorls, crossed by about sixteen high, thin, lamellæ, aculeate and angulate below the suture, interstices microscopically spirally striate. Length, 17·5 mill.

Off Martha's Vineyard, Mass.

S. ECHINATICOSTA, d'Orb. Pl. 13, fig. 98.

Whorls 6, rapidly enlarging, almost distinct, with about a dozen lamellæ, produced into three or four lobes on each whorl.

Length, 3·5 mill. *West Indies.*

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S. PERNOBILIS, Fischer and Bernardi. Pl. 13, fig. 5.

Whorls 5–6, rapidly increasing, ventricose, with deep suture, crossed by 14–15 strong, recurved lamellæ, with undulating edges, and somewhat aculeately produced above.

Length, 40 mill.

Ins. Marie-Galante, W. Indies.

Somewhat resembles, but is very much larger than *S. echinaticosta*, d'Orb. Also related rather closely to S. *turbinata*, Conrad, and *S. Pourtalesii*, Verrill and Smith.

S. FRONDOSA, Sowb. Pl. 13, fig. 7.

Subperforate, whorls 7–8, with about 14, rather stout, erect or slightly recurved lamellæ, a little produced above, forming a narrow shoulder. Length, 20 mill.

Mediterranean, Bay of Biscay.

The synonyms are, according to Dr. Jeffreys: *S. Celesti*, Aradas; *S. pumila*, Libassi; *S. rugosa*, Costa; *S. eximia*, Pecchioli; *S. Pecchioliana*, Issel; *S. Gravitellensis*, Seguenza, and *S. soluta*, Tiberi, 1868, not 1863.

S. PAUMOTENSIS, Pease. Pl. 13, fig. 16.

Thick, smooth, white; whorls 6, rounded, narrowly separated, with seven, stout, regular, continuous, recurved lamellæ.

Length, 9 mill.

Paumotus, Kingsmill and Viti Islands.

S. JAPONICA, Dunker. Pl. 13, fig. 15; Pl. 14, fig. 24.

White, smooth, with seven rounded, scarcely touching whorls, crossed by rather solid, obliquely continuous, subdistant lamellæ.

Length, 15 mill.

Japan.

This is *S. Japonica* of Reeve, not Nyst—the latter being a Constantia and substituted for *S. elegans*, A. Ad., preoccupied.

S. DECUSSATA, Pease. Pl. 13, fig. 14.

Rather thick, white; whorls 6, rounded, narrowly separate, crossed by seven stout, regular, continuous lamellæ, the interstices decussated by very minute raised striæ. Length, 9 mill.

Kingsmill, Viti and Sandwich Islands.

S. ANGUSTATA, Dunker. Pl. 13, fig. 13.

Narrowly turreted, white, whorls rounded, with equal, somewhat distant, continuous lamellæ, a little declining.

Length, 9 mill.

Japan.

S. SYMMETRICA, Pease. Pl. 13, fig 12.

Solid, white; whorls 6, contiguous, spirally striated, with 16 thick, slightly recurved, continuous varices. Length, 8 mill.

Tahiti.

S. GRACILENTA, Gould. Pl. 13, fig. 10.

Shell white, with 9 contiguous whorls, with profound suture, crossed by 16 thin, rather low lamellæ, the interstices minutely, spirally striated. Length, 6·25 mill.

Ins. Mangsi.

S. TEXTURATA, Gould. Pl. 13, fig. 9.

Subperforate, yellowish white; whorls 8, rounded, nearly separate, crossed by nine whitish, elevated reflexed ribs, slightly aculeate above, interstices microscopically decussated.

Length, 5 mill.

Hab. unknown.

One of the species of the Wilkes' Exploring Expedition, possibly Polynesian.

S. PHILIPPINARUM, Sowb. Pl. 13, figs. 18, 19.

Imperforate, white, or fulvous between the lamellæ; whorls about 10, well rounded, crossed by rather distant lamellæ, a little produced above. Length, 1 inch.

Philippines, Australia, Amboyna, etc.

This species is quite common in collections and seems to have a pretty wide distribution. Very probably some of the nearly related forms are really only slight variations and should be united with it

S. JUKESIANA, Forbes. Pl. 14, fig. 20.

Imperforate, white; whorls 9, narrower than the preceding species, separate at the suture, with more numerous, nearly equal lamellæ. Length, 17 mill.

Australia.

S. Wellingtonensis, Kirk, is said to be a synonym, but the specimens received under that name at the Philadelphia Academy, from a distinguished Australian conchologist, appear to = *S. Philippinarum.*

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S. SUBAURICULATA, Souverb. Pl. 14, figs. 22, 21.

Whorls 9, narrow, rounded, scarcely in contact, with seven rather solid, oblique, subreflexed lamellæ, interstices microscopically spirally striated. Length, 6·25 mill.

New Caledonia.

I place here as a synonym, but with some slight doubt *S. attenuata*, Sowb. (Fig. 21), a species described without locality, and the name subsequently changed by Canefri to *S. microsoma*, on account of the previously described *S. attenuata*, Pease.

S. GRACILIS, Sowb. Pl. 14, figs. 28, 29.

Whorls 9–10, narrow, well rounded, contiguous, fulvous, with subdistant, continuous, rather thick, white lamellæ, a little aculeate near the suture. Length, 18 mill.

Philippines.

If this species equals *S. subauriculata*, Souverb. described above, its name should take precedence.

S. CASTA, A. Ad. Pl. 14, fig. 23.

White, whorls 8, moderately convex, with distinct suture, the varices numerous, some rather thick, slightly aculeate at the suture. Length, 18 mill.

Japan.

S. CONCINNA, Sowb. Pl. 14, fig. 25.

Whorls 6, rapidly enlarging, contiguous, whitish, with numerous, close, rather thick, simple lamellæ. Length, 15 mill

Ins. Bohol, Philippines.

S. MULTICOSTATA, Sowb. Pl. 14, fig. 26.

Whorls 6–7, somewhat convex, fulvous, contiguous, crossed by numerous, rather thick, unequal, white varices. Length, 14 mill.

Ins. Corrigidor, Philippines.

S. OBLIQUA, Sowb. Pl. 14, fig. 27.

Thin, attenuated, white; whorls 7, rounded, scarcely contiguous, crossed by numerous, close, oblique varices, slightly angular near the suture. Length, 15 mill.

Habitat unknown.

S. MINDOROENSIS, Sowb. Pl. 14, fig. 31.

Whitish, with 5 or 6 rounded contiguous whorls, crossed by numerous, thick, rounded simple varices. Length, 17 mill.

Ins. Mindoro, Philippines.

S. ALBOLINEATA, Sowb. Pl. 14, fig. 30.

Chestnut colored between the varices; whorls 8, crossed by somewhat distant, rather thick, white varices, which are obscurely angular in the centre. Length, 14 mill.

Hab. unknown.

Said to resemble *S. Philippinarum*, but with the whorls less separated, and the varices slightly angular in the middle.

S. PULCHERRIMA, Sowb. Pl. 14, fig. 32.

Brownish purple; whorls 6, rapidly enlarging, slightly convex, contiguous, suture not deep, lamellæ numerous, oblique, white, acuminately lobed at the suture. Length, 12 mill.

Philippines.

This is *S. Catanuensis* of Reeve's plate but not of the description, the numbers of that species and of *S. pulcherrima* having been transposed on the plate.

S. PUMILA, A. Ad. Pl. 14, fig. 33.

Shell minute, rather short, ventricose, pale fulvous; whorls 6, rounded, distinct, with rather thick, rounded, approximate white varices. Length, 15 mill. (magnified?)

Japan.

S. CREBERRIMA, Hinds. Pl. 14, fig. 34.

Pale grey, smooth; whorls 6, well rounded, with numerous close, rather prominent lamellæ. Length, 15 mill.

New Guinea.

S. LACTEA, Krauss. Pl. 14, fig. 35.

Minute, whorls 9, white, with crowded small thin lamellæ, suture profound. Length, 8 mill.

Cape of Good Hope.

S. SULCATA, Sowb. Pl. 14, fig. 36.

Thin, white, minutely spirally striated; whorls 7, narrow, rounded, with moderate suture, and numerous, close, thin lamellæ.

Length, 18 mill.

Ins. Luzon, Philippines.

S. SUBTILIS, Sowb. Pl. 14, fig. 38.

Narrow, brownish, spirally minutely striated; whorls about 8, moderately convex, contiguous, slowly increasing, the lamellæ close, minutely crenulated. Length, 11 mill.

Philippines.

S. VESTALIS, Hinds. Pl. 14, fig. 37.

Whitish, very minutely spirally striated; whorls 6, rounded, crossed by numerous, close, minute, simple varices. Length, 14 mill.

New Guinea.

S. DELICATULA, Crosse. Pl. 14, fig. 39.

Thin, narrow, acuminated, very minutely spirally striated; whorls about 11, rounded, crossed by unequal ribs, most of them lamellar, some thickened, simple at the suture. Lengtn, 12 mill.

New Caledonia.

Reeve mentions a keel on the last whorl, but his figure does not show it, and it is neither in the original figures nor the descriptions.

S. OVALIS, Sowb. Pl. 14, fig. 40.

Minute, thick, bluish white; whorls 5, contiguous, somewhat convex, lamellæ oblique, white, thick, not numerous, elevated above the suture; aperture auriform, margin expanded. Length, 5 mill.

Ins. Mindoro, Philippines.

S. CONNEXA, Sowb. Pl. 14, fig. 41.

Pupiform, with obtuse spire, pale purple between the white lamellæ; whorls 5, very slightly convex, lamellæ oblique, white, close, connected. Length, 8 mill.

Ins. Luzon, Philippines.

S. DUCALIS, Mörch. Pl. 14. fig. 47.

Whorls 8, rounded, contiguous, crossed by regular, subdistant strong lamellæ, a little dilated and irregularly joined at the suture. Length, 1 in.

Xipixappi, W. Columbia.

This is not *S. principalis* of Pallas, for which it is erroneously figured in the Thesaurus and Iconica, The name was changed to *S. ducalis* by Mörch in 1875 and to *S. simillima* by Tapparone-Canefri, in 1876. *S. tenuis*, Gray (not Sowerby) is the juvenile.

S. ACICULINA, Hinds. Pl. 14, fig. 42.

Narrow, chestnut brown; whorls 9, rather convex, crossed by somewhat distant, thin, white, lamellæ, subangulated in the middle. Length, 9 mill.

? *W. Coast of America.*

S. POLITA, Sowb. Pl. 14, fig. 43.

Thin, highly polished, pale grey, very narrow, whorls 10, convex, with numerous, close, rather thin lamellæ, obsolete in the middle of the whorls. Length, 22 mill.

Xipixappi, W. Columbia.

S. ELENENSIS, Sowb. Pl. 14, fig. 44.

White, whorls 7, convex, with deep suture, lamellæ about 6, very distant, continuous, slightly plaited at the suture. Length, 10 mill.

St. Elena, W. Columbia.

S. HEXAGONA, Sowb. Pl. 14, fig. 45.

Thick, white; whorls 6, moderately convex, with six strong, oblique, thick lamellæ, Length, 15 mill.

Acapulco.

S. CURVILINEATA, Sowb. Pl. 14, fig. 46.

Whitish, whorls 6, oblong, not very convex, contiguous, lamellæ thin, curvilinear, simple. Length, 15 mill.

Sonsonate, Central America.

S. INDIANORUM, Carp. Pl. 14, figs. 48, 49.

Rather thin, white, whorls 10, rounded, scarcely in contact, with 8—15 (usually about 12) lamellæ, narrowly aculeated at the top of the whorls. Length, 1 in.

Vancouver's Isl.—California.

Var. TINCTA, Carp. Fig. 49.

Costae acute, not reflected, whorls posteriorly tinged with brownish purple.

Southern California.

S. VENOSA, Sowb. Pl. 14, fig. 50.

Smooth, white; whorls 9, separate, with about 11 lamellæ, somewhat reflected and subangulate at the suture. Length, 13—18 mill.

West Indies, Venezuela.

S. MODESTA, C. B. Ad. Pl. 14, fig. 60.

Ventricose, short, pale fulvous; whorls 7, rather convex, with rather distant simple lamellæ. Length, 14 mill.

West Indies.

S. ORBIGNYI, Nyst. Pl. 14, fig. 51.

Solid, white, whorls 9, with very deep suture, lamellæ 14, thick, low, angulated at the suture. Length, 15 mill.

West Indies, Patagonia.

It is *S. elegans*, d'Orb., not Risso.

S. ANGULATA, Say. Pl. 14, fig. 53.

Whorls about 7, subcylindrical, white, separate, with about 9–10, strong lamellæ, slightly angular above.

Connecticut to Florida.

This is *S. clathrus*, Say (not Linn.), and *S. Humphreysiana*, Kiener.

S. GRADATELLA, Mörch. Pl. 14, fig. 54.

Narrow, white, polished; whorls 9, flatly convex, with about 11, low lamellæ, a little angulated above. Length, 12 mill.

West Indies.

Narrow, with more whorls than the preceding species.

S. UNIFASCIATA, Sowb. Pl. 14, fig. 55.

White with a single narrow chestnut band at the suture; whorls about 7, with 6, straight, subcontinuous lamellæ. Length, 15 mill.

West Indies.

S. UNDECIMCOSTATA, Mörch. Pl. 14, fig. 56.

Solid, white or yellowish white, microscopically spirally striate; whorls 6, convex, with deep suture and 11 regular, strong, subcontinuous lamellæ. Length, 10 mill.

W. Indies.

S. EBURNEA, Pot. et Mich. Pl. 14, figs. 57, 58.

Rather thin, smooth, white, shining, with obsolete spiral striae; whorls about 9, very convex, with deep suture, with 12–13 sharp lamellæ. Length, 20 mill.

West Indies.

The synonyms are *S. fragilis*, Hanley (fig. 57) *S. albida*, d'Orb. (fig. 58), and probably *S. ligata*, C. B. Ad. Mörch has mentioned vars. *pumilio* and *angusta*.

S. TERES, Bush. Pl. 14, fig. 59.

Thin, semi-transparent, very shining, bluish white with a delicate pink apex; whorls about 9, very convex, crossed by about 27 very thin, delicate lamellæ, a little oblique, with an almost imperceptible angle at the suture. Length, 4 mill.

Cape Hatteras, N. Car.

S. NOV-ANGLIÆ, Couth. Pl. 15. fig. 62.

Thin, white, with here and there a rusty blotch; whorls cylindrical, barely touching, minutely decussated between the lamellæ; whorls 10, crossed by eleven, somewhat oblique, delicate lamellæ, not continuous, a little aculeate at the top of the whorls. L. 17·5 mill.

A single specimen from a fish, caught off

Cape Ann, Mass.

I know nothing of this species.

S. MULTISTRIATA, Say. Pl. 15, fig. 63.

Thin, white, very minutely spirally striated; whorls 8–9, very convex, crossed by about 15 slightly oblique delicate lamellæ, very slightly shouldered at the top of the whorls. Length, 18 mill.

Southern Coast of the United States.

S. CANDIDISSIMA, Monterosato. Pl. 15, fig. 64.

Narrow, rather thin, white; whorls 9, very convex, crossed by rather distant, simple lamellæ. Length, 15 mill.

Algiers.

Something like *S. eburnea*, Pot. et Mich., but narrower.

S. COMMUNIS, Lam. Pl. 15, figs. 65, 66.

Rather thick, smooth, flesh colored, with light purplish maculations, and usually a basal band of the same color; whorls about 12, scarcely in contact, with about 9 erect, broadly recurved varices, subcontinuous and also maculated. Length, 1·25—1·75 in.

Europe.

It is *S. clathrus* (not of Linnæus), authors, *S. laevigata*, Calcara.

S. TURTONIS, Turton. Pl. 15, fig. 67.

Resembling the preceding species in form and coloring, but the lamellæ flat, instead of raised, some of them much thicker than others, appearing like varices; the ribs are less convex than in *S. communis*. Length, 1—1·5 in.

Europe, Madeira.

The synonyms are *S. planicostata*, Bivona, *S. tenuicostata*, Mich.

S. CANTRAINEI, Weinkauff. Pl. 15, fig. 68.

Flesh color or corneous, trifasciate with brownish; whorls 10, a little flattened, with 12 strong lamellæ, a little coronate at the suture. Length, 5 mill.

Algiers–Bay of Biscay.

S. Kusmici, Brusina and *S. Trevelyana*, Tiberi are synonyms.

S. TREVELYANA Leach. Pl. 15, fig. 69.

Fleshy white, whorls 10, convex, rapidly increasing, with about 16 rather low, somewhat recurved lamellæ, some of them much thicker than the others. Length, 1 inch.

Northern Europe.

S. pseudopulchella, Seguenza is a synonym.

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S. CLATHRATULA, Adams. Pl. 15, figs. 70, 61; Pl. 13, fig. 17.

Rather thin, semitransparent, glossy, white, irregularly, indistinctly, spirally striated; whorls 12–13, convex, with deep suture, crossed by about 18, subequal, thin, erect lamellæ. Length, 15 mill.

Europe; *Madeira*; *New England.*

The last locality is for *S. Dalliana*, Verrill and Smith, (fig. 61), dredged by the U. S. Fish Commission, and which Dr. Jeffreys makes a synonym. *S. Georgettina*, Kiener has also been referred here by Dr. Jeffreys, probably correctly.

Var SPINOSA, Jeffreys.

The ribs a little aculeate at the suture.

Var. PRODUCTA, Jeffreys.

Spire longer, ribs much more numerous.

S. HELLENICA, Forbes. Pl. 15, fig. 71.

Narrow, subcylindrical, whorls 8, with low, distant costae, slightly coronate at the suture, aperture margined. Length, 8 mill.

Mediterranean Sea, Canary Islands.

The figure of *Rissoa coronata*, Phil. which I copy, appears to represent that genus rather than a Scalaria but Dr. Jeffreys makes it a doubtful synonym. He also refers here *S. Scacchii*, Hörnes.

S. PULCHELLA, Bivona. Pl 15, fig. 72.

White, whorls 10, very convex, with close, numerous, slender lamellæ. Length, 18 mill.

Mediterranean Sea.

S. BAIRDII, Smith, Pl. 15, fig. 73.

Bluish white, finely spirally striate; whorls 9, with moderate lamellæ, obsolete in the middle of the whorls, raised into knobs at the suture, where the interstices are somewhat pitted.

Length, 15 mill.

Whydah, W. Africa.

Reeve's figure of this species differs so much from the original illustration that I doubt it; it recalls *S. crenata*, Linn.

S. WEBBII, d'Orb. Pl. 17, fig. 53.

Whorls about 6, convex, spirally striated, with about 23, equal, low, slight lamellæ. Length, 4 mill.

Teneriffe.

Section Opalia, H. & A. Adams, 1853.

S. Dianæ, Hinds. Pl. 15, fig. 74.
Whitish, whorls ventricose, smooth, very rapidly enlarging, lamellæ distant, broadly expanded above. Length, 9 mill.

Amboyna.

S. consors, Crosse and Fisher. Pl. 13, fig. 11.
Narrow, whitish, whorls 11, rounded, in contact, with regular simple lamellæ, base with spiral rib. Length, 13 mill.

St. Vincent's Gulf, Australia.

S. philtata, Watson. Pl. 18, fig. 78.
Thin, subhyaline, white; whorls 7, flatly convex with deep suture, with about 25, longitudinal oblique lamellæ, cut across by two or three strong spiral furrows, causing the lamellæ to appear in prickly interrupted series, base with a spiral thread. Length, 2·5 mill.

Tristan d'Acunha, (100 to 150 fms.)

S. lamellosa, Lam. Pl. 15, figs. 84, 76, 77, 82, 83.
Whorls about 8, well rounded, smooth, flesh color, more or less definitely darker banded at the suture and above the basal rib, and intermediately marbled, lamellæ thin, white, blade-like, continuous. Length, 1–1·5 in.

Mediterranean, West Indies, Sandwich Is. Mauritius.

I include here several species which I find it impossible to separate by characters of value. Mörch (Jour. Philad. Acad. VIII, 200) says that the Mediterranean *S. pseudoscalaris*, Brocchi (fig. 77) differs in being narrower, with equal ribs, and that the Polynesian *S. perplexa*, Pease (fig. 83), has single high, alternating with pairs of lower ribs; but both these forms differ widely in series of specimens and are clearly traceable one into another.

I also include here *S. coronata*, Lam. (fig. 76) said by Kiener to come from Cape of Good Hope, and by Mörch believed to be West Indian: it appears to be merely a well-grown *S. lamellosa*, the number of lamellæ varying.

This is *S. clathrus* of Linnæus, 12 Edit. (not 10th Edit.) and of most American authors, and *S. monocycla*, Lam. (fig. 82). Monterosato has given the new name of *commutata* to the Mediterranean specimens because, he says, that of *S. lamellosa* is preoccupied by Brocchi for a large Grignon fossil, and the true *S. pseudoscalaris*, Brocchi is somewhat spinose. It does not seem advisable again to

change the name of this species, so long known as *S. clathrus*, and now equally well-established as *S. lamellosa*. Monterosato has given the name *candida* to a variety.

S. NAUTLÆ, Morch. Pl. 15, fig. 78.

Whorls about 8, convex, with subimpressed suture, lamellæ 12, linear, angularly reflexed at the suture. Length, 12·5 mill.

Mexican Gulf.

S. ANDREWSII, Verrill. Pl. 15, fig. 79.

Whorls 7, well-rounded, white, suture deep, lamellæ 13, regular, moderately elevated, the interstices crossed by spiral cinguli, which also render the ribs a little nodulous. Length, 5·5 mill.

Off Newport, R. I., 100 fms.

S. LONGISSIMA, Seguenza. Pl. 15, fig. 85.

Whorls 11, thick, whitish, closely, lightly, spirally striated, with low, broad longitudinal ribs and equal interspaces. Length, 18 mill.

European Atlantic.

Described as an Italian pliocene fossil.

S. FUNICULATA, Watson. Pl. 18, fig. 79.

Whorls 8–9, darkish colored, with fine close spiral striae, with 10–12 narrow, low, strong ribs and much wider interspaces. Length, 6 mill.

Off Pernambuco, Brazil.

S. ACUS, Watson. Pl. 16, fig. 92; Pl. 18, fig. 80.

Solid, white, faintly spirally striate; whorls 12, flatly convex, constricted at the suture, ribs 15–17, strong, rounded, with somewhat narrower interspaces. Length, 5·5 mill.

N. Atlantic, 49–1254 fms; *W. of Azores*, 1000 fms; *off Culebra, W. Ind.* 390 fms.

S. TORTILIS, Watson. Pl. 18, fig. 76.

Whorls about 10, well rounded, slowly enlarging, with 9–10 close-set thread-like spiral striae, extending over the 14 remote, distant, longitudinal ribs. Length, 10 mill.

Off Culebra, W. Ind., 390 fms.

S. COARCTATA, Jeffreys. Pl. 15, figs. 80, 86.

Whitish, or brownish white, solid; whorls 7–9, convex, with very slight close spiral striae, and about 20 longitudinal, low, rounded ribs, with equal interstices. Length, 13 mill.

Norway.

S. *obtusicostata* (fig. 80) and *S. varicosa* (fig. 86) of Sars, not Brocchi, are synonyms.

S. Ochotensis, Middendorff. Pl. 15, fig. 87.

Thick, white, subdiaphanous; whorls numerous, flatly convex, with irregular spiral impressed striae, and very irregular thick slightly oblique, low ribs. Length, 60 mill.

So. Coast of the Sea of Ochotsk.

One of the giants of the genus.

S. borealis, Gould. Pl. 16 fig. 89.

Solid, whitish, smooth, with seven or eight stout ribs and much wider interspaces, whorls about 8. Length, 1·5 in.

Vancouver's Isl. northward.

On account of *S. borealis*, Beck, an unacknowledged species, the name was changed independently in the year 1876 by Canefri to *S. Gouldii*, and by Mörch to *S. Wroblewskyi*.

S. australis, Lam. Pl. 16, fig. 90.

Thick, whitish, whorls about 10, slightly convex, smooth, with 9 or 10 very thick, rounded ribs. Length, 1·5 in.

Australia.

Very closely allied to the preceding species, which has been confounded with it. About the only differences consist in one or two more ribs to each whorl. It remains to be seen whether this difference is constant.

S. Magellanica, Phil. Pl. 15, fig. 88.

Shell white, solid, subventricose; whorls 8, distinct, with rather thick, numerous ribs, bent in a roundish angle near the suture. Length, 1 in.

Straits of Magellan.

S. Grœnlandica, Chemn. Pl. 16, fig. 91.

Whorls 10–11, convex, thick, distantly spirally grooved, contiguous, with stout, recurved or sub-decumbent ribs. Length, 1·5 in.

Greenland to Massachusetts.

S. subulata, Couthouy is a synonym; as is also *S. planicosta*, Kiener.

S. Loveni, A. Adams. Pl. 16, fig. 94.

Whorls 8, somewhat convex, spirally sulcate, ribs flattened, bluntly aculeate above. Length, 15 mill.

Arctic Sea.

Perhaps a small variety of the preceding species, from which it differs in the produced terminations of the ribs.

S. UNCINATICOSTA, d'Orb. Pl. 16, fig. 95.

Whorls about 6, whitish or yellowish, with distinct, regular spiral liræ, with 12 strong, thick equal lamellæ, aculeate above.

Length, 7 mill.

West Indies.

S. CANDEANA, d'Orb. Pl. 16, fig. 96.

Whitish, shining, whorls 6, rapidly enlarging, convex, with close spiral liræ, and 12–16 simple ribs. Length, 6–9 mill.

West Indies.

S. acuta, Pfr, is a synonym.

S. CRENATA, Linn. Pl. 16, figs, 15, 97, 98.

Thick, white, closely spirally striated, with about 12 rather close, low spiral ribs, usually becoming obsolete on the middle of the last whorl and produced above into sutural crenulations.

Length, 15–17 mill.

Southern Europe; *Canary Is*; *W. Indies.*

It is *S. raricostata*, Costa.

Var. S. CRENULATA, Kiener. Fig. 97.

The West Indian specimens are wider than those of the Mediterranean and Mörch considered them a distinct species, they are so close, however, in other respects, and particularly in the peculiar appressed sutural crenulations of the ribs, that I hesitate to give them a separate position.

Var HOTESSIERIANA, d'Orb. fig. 98.

A very narrow form, differing considerably from the usual West Indian type, as above, being as much narrower than *S. crenata* as the former is wider. Length, 11·5 mill.

West Indies.

S. crassicosta, Gray Ms. and of C. B. Adams are both referred here by Mörch; the former, which is figured by Sowerby from a specimen without locality in the British museum (fig. 15) appears more like the typical *S. crenata*. On account of the fossil *S. crassicostata* Desh. Nyst changed Gray's name to *S. grossicostata*. Mörch adds *S. conifera*, Mtg.

Var. CRENATOIDES, Carp. Pl. 16, fig. 1.

Stout, like Var. *crenulata*, but shorter. Length, 13 mill.

Cape St. Lucas, S. Diego, Cal.

Carpenter writes "additional specimens may connect this with the Portuguese *S. crenata*," and again, in describing the pleistocene fossil ? Var. *insculpta*, "it is quite possible that the three forms had a common origin."

S. DIADEMA, Sowb. Pl. 16, figs. 99, 100.

Solid, short, ventricose, shouldered, smooth, pale fulvous or greyish, with thick longitudinal ribs, nodose at the shoulder-angle, sometimes obsolete on the middle of the last whorl. Length, 18 mill.

Gallapagos Is.

S. ZELEBORI, Frauenfeld. Pl. 15, fig. 75.

Whorls 9, very convex, strongly spirally costate, with rather broad, somewhat recurved lamellæ, white, somewhat solid.

Length, 22 mill.

New Zealand, Australia.

S. VULPINA, Hinds. Pl. 15, fig. 81.

Orange brown, thick, spirally striated; whorls 10, well rounded, with strong, rib-like lamellæ. Length, 6 mill.

Straits of Malacca.

Section AMÆA, H. & A. Adams. 1853.

S. MAGNIFICA, Sowb. Pl. 16, fig. 16.

Whorls 10, well-rounded, thin, with spiral riblets and somewhat wider interstitial spaces showing growth-striæ, on the last whorls occasional longitudinal, narrow ribs, white or brownish white.

Length, 4·25 in.

? *China.*

It is *S. principalis*, Chemn. not Pallas.

S. MARTINII, Wood. Pl. 16, fig. 5.

Thin, white; whorls 7–8, convex, very minutely, closely, spirally striated, with occasional or numerous, irregular, varix-like ribs.

Length, 1 in.

Philippines, Mauritius.

Reeve's locality, West Indies, is erroneous. *S. striata*, Kiener, is a synonym.

S. RARICOSTATA, Lam. Pl. 16, figs. 2, 3.

White, rather thick, fimbriately cancellated (when fresh) by close fine lamellæ and spiral striæ, with occasional stout variceal ribs; whorls about 6, rapidly enlarging and very convex.

Length, 1 inch.

Ceylon, Mauritius.

It is *S. reticulata*, Helbling.

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S. SUTURALIS, Hinds. Pl. 16, fig. 8.

Narrow, whitish, stained with brown, minutely spirally striated; whorls 9-10, convex, contiguous, rather compressed, keeled and grooved at the suture, with very infrequent rounded varices.

Length, 9 mill.

Malacca.

S. GENICULATA, Brocchi. Pl. 16, fig. 17.

Reddish brown, whorls 8, well rounded, with fine, close, longitudinal lamellæ and occasional thick varices. Length, 1 in.

Atlantic and Mediterranean Europe.

First described as a pliocene fossil. Recent specimens are occasionally dredged at considerable depths.

S. TURRICULA, Sowb. Pl. 16, figs. 13, 4, 6.

Covered perforate, rather thin, turreted, white, often with two faint chestnut bands, with very close fine spiral liræ; whorls 8–9, with 12–13 lamellæ, some of which are varicose. Length, 18 mill.

West Indies.

S. turrita, Nyst is a synonym; *S. nuda*, Sowb. (figs. 4, 6), described without locality, appears to be another.

S. LINEATA, Say. Pl. 16, figs. 14, 9.

Shell thick, shining, porcellanous, with traces of fine lamellæ, with wider interspaces, and occasional varices; whorls 6–7, moderately convex, white or yellowish or brownish white with two narrow chestnut bands, the lower one the most conspicuous.

Length, 12–15 mill.

Southern Atlantic Coast of the United States.

Reeve's figure represents a specimen in which the lamellæ are unusually developed, whilst the normal denuded state is described as a new species, *S. unicostata*, Sowerby (fig. 9), and changed by Canefri to *S. Fischeriana* on account of *S. uncinaticosta*, d'Orb, mistaken by him for *unicostata*.

S. ERRONEA, Canefri. Pl. 16, fig. 7.

Attenuated, smooth, whitish, with fulvous apex, whorls 8, convex, with rare varices. Length, 18 mill.

? *Port Jackson, Australia.*

Wrongly figured by Sowerby for *S. Mörchi*, Angas, which is a very different species.

Section ACIRSA, Mörch, 1857.

S. GRANULOSA, Quoy. Pl. 16, fig. 11.

Rather thick, fulvous, with a white band, or whitish, very minutely nodose, with vestiges of ribs, gathered and crenulated at the suture; whorls about 9, a little sloping. Length, 1–1·25 in.

Swan River, Australia.

Very closely allied to *S. costulata*, Mighels and Adams, and may be a variety; it has about the same nearness to that species that *S. Australe* has to *S. borealis*.

S. COSTULATA, Mighels and Adams. Pl. 16, figs. 10, 12, 18.

Whitish or greyish fulvous, thick; whorls 8, slopingly, slightly convex, with a spiral rib below, upper portion more or less distinctly longitudinally ribbed, gradually fading until the body whorl is smooth or nearly so. Length, 18–22 mill.

Greenland to Cape Cod, Mass.

Mighels describes a young specimen, in which the ribs are more apparent. The synonymy includes *S. borealis*, Beck, 1839, probably (not described), *S. Eschrichti* (Holb.), Möller (fig. 12), *Turritella Hibernica*, Waller, and *S. undulata*, Sowb. (fig. 18).

S. SUBDECUSSATA, Cantraine. Pl. 16, fig. 19.

Whorls about 11, rather flattened, the upper ones with longitudinal ribs, which soon become obsolete, distantly, lightly, spirally striated, a slight spiral rib on the base of the body whorl. Length, 23 mill.

Mediterranean.

Like *S. costulata*, but narrower. The synonyms are *S. Philippii*, Aradas, and probably *S. striata*, A. Ad., said to come from the Philippines.

S. GRACILIS, Verrill. Pl. 16, fig. 20.

Whorls about 6, well rounded, with deep sutures, and rather prominent, close, rounded ribs, fading out on the middle of the body whorl. Length, 5 mill.

Martha's Vineyard.

Probably not adult.

S. PYRRHIAS, Watson. Pl. 18, fig. 75.

Shell thin, slopingly shouldered, white; whorls about 8, rapidly enlarging, with several distant spiral threads just below the shoulder-angle, and about 11, oblique, procumbent lamellæ. Length, 5 mill.

Off Culebra Isl., West Indies, 390 fms.

Section CIRSOTREMA, Mörch, 1852.

S. KIENERI, Canefri. Pl. 17, figs. 21, 22, 26.

Whorls about 15, well rounded, with a narrow shoulder above, aculeately decussated by spiral ridges crossing thin longitudinal lamellæ. Length, 2·75 in.

Mauritius, New Caledonia.

S. cancellata, Humphreys, is a synonym. For the figure given by Kiener for this species (fig. 26) Canefri has substituted the name *S. Kieneri*, as he believes it to be different not only from Lamarck's species (a Grignon fossil), but also from Sowerby's figure. To the latter I cannot agree, for making due allowance for a worn specimen, and the general unnaturalness resulting from the method of drawing Kiener's figures, they appear like enough.

S. VARICOSA, Lam. Pl. 17, figs. 23, 27.

White, thick, cancellated by spiral and longitudinal lamellæ, the longitudinal sculpture more prominent, fimbriated, with occasional strong tuberculated varices and a spiral basal rib; whorls 12, with very slight shoulder and deep suture. Length, 2 in.

Philippines, Australia, Mauritius.

S. attenuata, Helbling and *S. fimbriata*, Lam. are synonyms.

Var. ABBREVIATA, Sowb. Fig. 27.

Shorter and thicker, the lamellæ aculeate at the top of the whorls, the margin crenated. Length, 1 in.

Mauritius.

S. COCHLEA, Sowb. Pl. 17, figs. 24, 25.

White, spirally striate, fimbriating the numerous rather thin, sharp longitudinal lamellæ, with occasional thick tubercular lamellæ; whorls 8, with flattened shoulder and deep suture, basal rib fimbriated. Length, 1·5 inch.

Mediterranean Sea, Madeira, W. Coast of Africa, West Indies.

Distinguished from the preceding species by its flattened shoulder and general corkscrew-like appearance. The name of *varicosa* has been applied to this species but the figure in the Encyc. Meth. cited by Lamarck, although very poor, could never be mistaken for *cochlea*. Brocchi, in 1814, described an Italian fossil under the name of *S. pumicea* (fig. 25) which has been identified by several good naturalists with the present species; if this identification be correct, Brocchi's name should have precedence, but I am not sat-

isfied of this. Another name for the fossil species is probably *S. serrata*, Calcara.

S. MULTIPERFORATA, Sowb. Pl. 17, fig. 33.

Fulvous, with broad, decumbent, undulated ribs, angularly fluted on one side, the interstices pitted; whorls 8, compressed, channeled at the suture, crowned with raised points, last whorl keeled below, pitted at the keel, varices few, irregular, thick, raised and produced at the suture. Length, 15–18 mill.

Mauritius, Singapore.

S. MORCHI, Angas. Pl. 16, fig. 7.

Solid, whitish; whorls 9, rounded, decussated with longitudinal ribs and more numerous spiral ridges, the longitudinal ones evanescent at the base, suture impressed. Length, 10 mill.

Port Jackson, Australia.

S. CRASSILABRUM, Sowb. Pl. 17, fig. 32.

Whitish or yellowish white; whorls 7, subbiangular, shouldered with deep suture, rather obsoletely ribbed, aperture with thick, expanded, minutely striated margin. Length, 6 mill.

Philippines; Central America; Mazatlan.

I know nothing about this species or its localities.

S. BICARINATA, Sowb. Pl. 17, fig. 28.

Subcylindrical, whitish, narrow, very minutely cancellated, with two spiral ribs on the body whorl, suture pitted. Length, 18 mill.

Philippines.

Perhaps a variation of the last species.

S. ATTENUATA, Pease. Pl. 17, fig. 29.

Narrower and more tapering than the preceding species, with the keels on the last whorl nodose and much less distinct. Length, 11 mill.

Sandwich Islands.

Very probably a mutation of the preceding form.

S. LEEANA, Verrill. Pl. 17, fig. 31.

Whitish, with well rounded ribs and deep suture, the ribs and interspaces both crossed by numerous fine, spiral striæ, each whorl with a strong varix. Length, 5·5 mill.

Off Martha's Vineyard, 146 fms.

S. DENTISCALPIUM, Watson. Pl. 18, fig. 77.

White, with 10 convex whorls and moderate suture, with very numerous, oblique, minute riblets, and finer and more numerous

spiral striæ, mouth encircled with a strong varix. Length, 4 mill.

Torres Sts., N. Australia.

Section ACRILLA, H. Adams, 1860.

S. ACUMINATA, Sowb. Pl. 17, figs. 30, 35.

Narrow, with 15 somewhat convex whorls, pale fulvous, with two chestnut bands, and very numerous, close longitudinal, curved striæ, base keeled. Length, 1·5–1·75 in.

Malacca, Japan.

S. FUSCA, Sowb. Pl. 17, fig. 37.

Narrow, with 9 somewhat convex whorls, yellowish brown with longitudinal chestnut flames, spirally very finely striated. Length, 22 mill.

Sierra Leone.

S. MINOR, Sowb. Pl. 17, fig. 38.

Whorls 8, well rounded, a little angular above, yellowish brown, with two spiral chestnut bands, obliquely, longitudinally sinuously ridged, with a single spiral ridge at the lower part of the body whorl, and chestnut colored below it. Length, 18 mill.

Mouth of the Indus.

Described by A. Adams under the preoccupied name of *gracilis*. Its nearest ally is *S. acuminata*.

S. PRÆLONGA, Jeffreys. Pl. 17, fig. 36.

Whorls 12–15, convex, gradually enlarging, with numerous subdistant, oblique, curved, riblets, and about 5 spiral striæ, whorls angulated in the middle, base with a spiral keel, and smooth below it. Length, 17·5 mill.

N. Atlantic.

Unfigured Species.

S. FORMOSA (for S. pulcherrima, Mts., not Sowb.), S. HISPIDULA and S. STRIATISSIMA, Monts. *Mediterranean.*

S. RUPICOLA, Kurtz. *N. Carolina.*

S. LEPTALEA, Bush. *N. Carolina.*

S. SUBVARICOSA (Dkr. Ms.), S. SCÆVE, S. FILARIS, S. ÆOSPILA, S. PRETIOSULA, S. TURRITELLULA, and var. RIISEI, S. OCTOCOSTATA, S. QUINDECEMCOSTATA, S. MICROMPHALA, S. ERECTISPINA, S. VOLUBILIS, S. SPINÆ-ROSÆ, S. SPURIA (*S. pseudo-scalata*, Chemn.), S. NOVEMCOSTATA, all of Mörch. *West Indies.*

S. CRISPA, Lam. Kiener. Fossil.

S. BÖTTGERI, S. TROCHIFORMIS, S. SENEGALENSIS, Maltzan. *Senegal.*

S. KOBELTI, Jickeli. *Red Sea.*

S. SPIRALIS, S. LILIPUTANA, S. PRÆCLARA, S. FIMBRIATA, S. ELEGANTULA, S. TRABECULATA, S. SOLUTA, S. (OPALIA) EXQUISITA, S. (CIRSOTREMA) CRIBARIUM, (S. CIRSOTREMA) TURBONILLA, all of A. Adams. *Japan.*

S. TENELLA (*S. lineolata*, Htn., not Kiener, and *S. lyra*, Htn., not Sowb.) Hutton. *New Zealand.*

S. CANCELLATA, Woods. *Tasmania.*

S. FUCATA, S. MILLECOSTATA, S. UMBILICATA, Pease. *Sandwich Is.*

S. REFLEXA, S. CREBRICOSTATA, S. BELLASTRIATA, S. SUBCORONATA, S. HINDSII, S. (OPALIA) RETIPOROSA, S. (OPALIA), SPONGIOSA, S. (ACIRSA), MENESTHOIDES, all of Carpenter. *W. Coast of N. America.*

S. CROSSEANA (*S. bullata*, Carp., not Sowb.) and S. CARPENTERI (*S. raricostata*, Carp., not Lam.) Tapparone Canefri. *W. Coast of N. America.*

Subgenus CONSTANTIA, H. Adams, 1860.

S. JUCUNDA, Canefri. Pl. 17, fig. 41.

Thin, pale brown, rimate, whorls 6, slightly convex, the three first smooth, the others decussated by slight close longitudinal plications and spiral striæ. Length, 4 mill.

Straits of Corea.

Described by A. Adams under the name of *Constantia elegans*, which being preoccupied in Scalaria, was changed by Nyst to *Japonica* (also preoccupied) and subsequently by Canefri as above.

S. TANTILLA, A. Ad. (unfigured). *Japan.*

Subgenus CROSSEIA, A. Adams, 1865.

S. MIRANDA, A. Ad. Pl. 17, fig. 48.

White, whorls 3–4, rapidly increasing, very convex, spirally striate, and with 3–4 thin, low, longitudinal varices, aperture produced below. Length, 4 mill.

Is. Gotto, Japan, 71 fathoms.

S. BELLULA, A. Adams. Pl. 17, fig. 46.

More globose than the preceding species, regularly spirally striated with trellised interstices, umbilicus covered by a callus, columella projecting at the base. Length, 1·5 mill.

Is. Gotto, Japan, 64 fms.

Very probably an embryonic shell, and its pertinence to this group is somewhat doubtful.

S. CONCINNA, Angas. Pl. 17, fig. 45.

Narrowly umbilicated, rather solid, white, semipellucid, suture distinct, whorls 5, rounded, first three transversely ribbed and longitudinally striated, remainder transversely punctate-striate; umbilicus bordered by a rounded callus; aperture with a channeled angular projection in front. Diam. 4 mill.

Port Jackson, Australia.

This species, like the last, appears to be a young shell, and a doubtful member of the group.

S. STRIATA, Watson. Pl. 18, fig. 68.

White, spirally striated, with a small, strongly bordered umbilicus; whorls 4, well rounded, a litle tabulated below the suture, last whorl tumid. Length, 1·5 mill.

Near Cape York, N. Australia.

Differs in form and striæ from the preceding species.

S. CANCELLATA, (*Delphinula Johnstoni*, Beddome), and S. LABIATA, Tenison Woods. Unfigured. *Tasmania.*

Genus SCALIOLA, A. Ad., 1860.

S. BELLA, A. Ad. Pl. 17, fig. 39.

Umbilicated, thin, white; whorls 9, convex, covered with agglutinated grains of sand, suture channeled. Length, 4 mill.

Japan.

S. CALEDONICA, Crosse. Pl. 17, fig. 42.

Umbilicus scarcely rimate, whitish, with agglutinated grains of sand; whorls 9, convex. Length, 3·25 mill.

New Caledonia.

Differs in form from the preceding species.

S. ARENOSA, A. Ad. Pl. 17, fig. 47.

Scarcely rimate, turriculated, with narrow shoulder, white; whorls 7, convex, suture deep. Length, 2·75 mill.

N. Australia; Honolulu, Sandwich Is.

Unfigured Species.

S. GLAREOSA and S. GRACILIS, A. Ad. *Japan.*

S. ELATA, Semper Ms. *Red Sea.*

Genus EGLISIA, Gray, 1840.

E. SPIRATA, Sowb. Pl. 18, fig. 58.

Pyramidally turreted; whitish, obliquely stained with fulvous brown; whorls 12, concavely shouldered at the suture, spirally somewhat obtusely ridged. Length, 2 in.

St. Thomas, W. Indies.

It is *E. suturalis*, Gray. A very rare shell.

E. LANCEOLATA, Reeve. Pl. 18, fig. 59.

Light fulvous bay, with 8 rather obscure spiral ridges, the interstices microscopically cancellated; whorls about 18, rounded, with deep suture. Length, 1·5 mill.

Ins. Luzon, Philippines.

E. TRICARINATA, Ads. and Reeve. Pl. 18, figs. 60, 61.

Turreted, of 18 tricarinate whorls, cancellately striate, slightly shouldered, with deep suture, ashy brown. Length, 2·25 in.

China Sea.

Var. CONSPERSA, Ads. and Reeve. Fig. 61.

Longitudinally undulated with chestnut.

E. GRACILIS, Maltzan. Pl. 18, fig. 62.

Turreted, whorls 9, distinct, shouldered, closely spirally striated, violet brown, somewhat tessellated with whitish, aperture chestnut. Length, 15 mill.

Ins. Goree, W. Africa.

A variety is yellowish with sigmoid flames and dots of brown. It is the type of the genus *Smithia* of Maltzan, but appears to differ only from the typical *Eglisia* in being a little more unwound.

Unfigured Species.

E. CUMINGII, A. Ad. *Japan.*

E. PLICATA, Hutton. *New Zealand.*

Genus ACLIS, Lovën, 1846.

Section ACLIS (sensu stricto).

A. ASCARIS, Turton. Pl. 17, fig. 50.

Whorls 8–9, convex, with deep suture, white, solid, semitransparent, rather glossy, with four or five strong spiral ridges, base of

body whorl smooth. Length, 2·5 mill.

N. Europe.

A. SUPRANITIDA, Searles Wood, Pl. 17, figs.49, 56.

Whorls 12, broader, and more rapidly increasing than in the preceding species, distinctly umbilicated, surface varying from smooth and glossy to several spiral ridges, obsolete or distinct, round shouldered. Length, 6·25 mill.

Europe, Madeira.

A. WALLERI, Jeffreys. Pl. 18, fig. 65.

Narrowly umbilicated, whorls 10, rather convex in the middle, sloping above and below, with deep suture, shell very thin, transparent, lustrous, with a few microscopic spiral striæ.
Length, 3·5 mill.

N. Europe, Labrador, N. England.

It is *A. Nisoides*, Brugn.

A. CARINATA, Smith. Pl. 18, fig. 63.

Whorls 9, slightly convex, with narrow spiral sulcations, the periphery subacutely carinated; soiled white. Length, 10 mill.

Whydah, W. Africa.

A. STRIATA, Verrill. Pl. 18, fig. 70.

Whorls 5, well-rounded, with deep suture, whitish, rimate, closely spirally striated. Length, 4 mill.

Near Eastport, Me.; off Newport, R. I.

A. TENUIS, Verrill. Pl. 18, fig. 71.

Very slender, white, glossy, whorls 9, evenly rounded, nearly smooth, with microscopic spiral lines or obscure angles on the lower whorls, suture well impressed, umbilicus rimate. Length, 3·8 mill.

Off Martha's Vineyard, Mass., 100 *fms.*

Section HEMIACLIS, Sars., 1878.

A. VENTROSA, Jeffreys. Pl. 16, fig. 93.

White, whorls 8, well rounded, smooth, rapidly increasing, suture well impressed, narrowly margined. Length, 6 mill.

Lofoten Isl.; Bergen; Mediterranean Sea.

A. inflata, Monts. is a synonym.

A. GLABRA, Sars. Pl. 18, figs. 72, 73.

Shining, vitreous, white, smooth; whorls 9, convex, narrower and not so rapidly increasing as the preceding species. Length, 5·5 mill.

Norway

A. EXIGUA, Sars. Pl. 17, fig. 57.

Whitish, subopaque, glabrous, whorls 8, slightly convex, the last a little dilated at the aperture, umbilicus distinctly rimate. Length, 2 mill.

Arctic Norway.

A. ATTENUANS, Jeffreys. Pl. 17, fig. 40.

Thin, white, smooth, transparent, glossy; whorls 6–7, convex, suture well-defined, but not deep. Length 1·25 mill.

Mediterranean.

The aperture is a little more contracted below than in the last species and the columella more perpendicular; perhaps not adult.

A. SARISSA, Watson. Pl. 17, fig. 54.

Smooth, white, glossy, umbilicus a mere chink; whorls 9; well rounded; with a few slight growth lines. Length, 3·75 mill.

Off Pernambuco, 350 fms.

Broader, with fewer, rounder whorls than in *A. Walleri*.

A. MINUTISSIMA, Watson. Pl. 17, fig. 55.

Smooth, pale brownish hyaline; whorls 7, slightly convex, aperture a little narrowly produced below. Length ·25 mill.

Off Raine Isl., N. E. Australia, 155 fms.

Probably the smallest known gastropod, being the one-hundredth of an inch in length.

Section GRAPHIS, Jeffreys, 1867.

A. UNICA, Montagu. Pl. 18, fig. 66.

Thin, white, semitransparent, somewhat glossy, with numerous flexuous, longitudinal ribs, reticulated by many fine spiral ridges or striæ; whorls 9–10. moderately convex, very slowly increasing, with deep suture. Length, 3 mill.

Europe.

A. GRACILIS, Jeffreys. Pl. 18, fig. 67.

Thick, semitransparent, glossy, yellowish white; whorls 5½, convex, very slowly increasing, a little round shouldered, with about

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25 sharp, flexuous, longitudinal ridges, and no spiral sculpture. Length, 2·5 mill.

Mediterranean, Bay of Biscay, W. Africa, Azores.

A. HYALINA, Watson. Pl. 17, fig. 52.

Minutely umbilicated, thin, glossy, white; whorls 12, convex, smooth or with faint indications of ribs, especially on the upper whorls, under a lens the surface appears angulated or malleated with slight decussating striæ. Length, 10 mill.

Off Pernambuco, 350 fms.

A. JEFFREYSII, Tryon. Pl. 18, fig. 69.

Thin, semitransparent, glossy, whitish; whorls 8, very slowly enlarging, with close, longitudinal, thread-like riblets, and very slight microscopic spiral striæ; no umbilicus. Length, 3·75 mill.

Tunis; W. Coast of Africa, 300–1261 fms.

Described by Dr. Jeffreys as *A. striata*, a name preoccupied by Prof. Verrill.

A. MIZON, Watson. Pl. 17, fig. 51.

Thin, lustrous, white; whorls 15–16, convex, with about 40 feeble, unequal, rounded riblets; minutely umbilicated. Length, 15 mill.

Teneriffe.

Section PHERUSA, Jeffreys, 1869.

A. GULSONÆ, Clark. Pl. 17, fig. 43.

Very thin, transparent, lustrous, clear white, without sculpture, spire with a blunt, nearly globular apex, which is decidedly introverted but not sinistral; whorls 6–7, convex, with deep suture; outer lip remarkably flexuous, prominent, expanding, almost notched below; umbilicus closed, but with a chink-like depression. Length, 1·7 mill.

Europe, Madeira.

Section IOLÆA, A. Adams, 1860.

A. SCITULA, A. Ad. Pl. 17, fig. 44.

Rather solid, white; whorls 6, slightly convex, with subdistant spiral grooves, the interstices longitudinally finely striated. Length, 3 mill.

Strait of Corea.

Unfigured Species of Aclis.

A. (Iolæa) amabilis, A. (Iolæa) sculptilis, A. Ad. *Japan.*

A. labiata, A. cingulata, A. sulcata, A. lirata, A. fulgida, A. crystallina, A. Loveniana, A. (Ebala) diaphana, A. (Ebala) scintillans, A. (Ebala) vestalis, A. (Ebala) virginea, all of A. Adams. *Japan.*

A. angulata, Fischer. Figure inaccessible.

A. crenulata, Folin. *Andaman Is.*

A. micra, A. turrita, Petterd. *Tasmania.*

A. hyalina, Hutton. *New Zealand.*

A. tristriata, Tenison-Woods. *Tasmania.*

A. polita (Verrill). =Eulimella, Manual, viii, 342.

Genus STILBE, Jeffreys, 1884.

S. acuta, Jeffreys. Pl. 18, fig. 64.

Umbilicus minutely rimate, thin, semitransparent, milk white smooth; whorls 10, moderately convex. Length, 6·25 mill.

N. Atlantic O.; Long. 54° 33′ W., lat. 55° 36′ N.; 1622 fms.

INDEX AND SYNONYMY.

SCALARIIDÆ, IANTHINIDÆ, TRICHOTROPIDÆ.

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Family *CERITHIIDÆ.*

Shell spiral, elongated, many whorled, frequently varicose, the surface usually tuberculated, spinose or costulate; aperture channeled in front, the outer lip generally expanded in the adult. Operculum corneous, spiral with central or sublateral nucleus.

Animal with a short contractile muzzle, distant, slender tentacles and eyes on peduncles connate with the tentacles or sessile at their base; mantle margin with a short, rudimentary siphonal fold.

Dentition.—The usual formula is 2·1·1·1·2 (Pl. 19, figs. 1, 2), but in Triforis the marginal teeth are multiplied 4·1·1·1·4 (Pl. 19, fig. 3).

The Cerithiidæ occur principally about tropical and semitropical shores, on rocks or among marine plants, littoral or in shallow waters. Many of them are estuary mollusks, and some inhabit fresh waters.

The shell is very variable in form, and especially in the anterior canal of the aperture, which is always short, but sometimes disappears completely.

The Cerithiidæ have been monographed by:

Kiener. Coquilles vivantes. 81 species. No date.

Sowerby. Thesaurus Conchyliorum, ii. 184 species. 1855.

Sowerby. Reeve's Conchologia Iconica, xv. 232 species. 1865–6.

Dr. Jousseaume has recently published a monograph of Triforis, —of which he has made a family, with a number of genera (*Bull. Soc. Mal. France, i,* 217, 1884).

Genus CERITHIUM, Adanson, 1757.

Shell turreted, imperforate, many whorled, tuberculate usually, with indistinct varices; aperture small, with a short posterior channel and a better marked oblique one in front, outer lip expanded, inner lip thickened, concave. Operculum corneous, paucispiral, with submarginal nucleus. Animal (Pl. 19, figs. 14, 13) truncated and grooved in front, attenuated behind; muzzle large and long, sinuated at the end, tentacles thickened posteriorly and bearing eyes externally at a short distance from their base; siphon short. Foot secreting a mucous thread by which the animal is able to suspend itself (Pl. 19, fig. 6). Some of the species emit a bright green fluid when molested.

Central tooth of the radula multicuspidate, lateral securiform, the margin toothed, marginals narrow, with comb-like extremities (Pl. 19, fig. 1).

Marine, inhabiting temperate and tropical seas; fossil, nearly 500 species are enumerated, commencing in the Trias and attaining its maximum development in the Cretaceous.

Subgenus CERITHIUM (sensu stricto).

Columella thickened, with a tooth-like posterior tubercle, outer lip dilated at the base, whorls varicose.

Section COLINA, H. and A. Adams, 1853.

Shell elongated, whorls numerous, convex, nodulous, spirally striated, aperture oval, prolonged in front into a short recurved canal, columella simple, oblique, outer lip expanded and reflexed. Middle whorls gibbous, sculpture usually obsolete on the last whorl.

The few species inhabit deep water, sandy bottom, at the Philippines, China, etc.

Section LIOCERITHIUM, Tryon, 1887.

Shell pupoidal or subcylindrical, without ribs or nodules, usually spirally grooved. C. INCISUM, Sowb.

Subgenus STILUS, Jeffreys, 1885.

Shell spit-shaped, reticulated; apex forming a twisted and abruptly semi-detached peak; basal groove short and recurved. S. INSIGNIS, Jeffreys.

Subgenus CERITHIODERMA, Conrad, 1860.

Acutely ovate, striate; lip grooved, umbilicated, columella recurved inferiorly or subtruncate; aperture patulous, margin obtusely rounded inferiorly; beak very short, narrow, recurved.

Fossil only. C. PRIMA, Conr. Eocene, Alabama (Struct. and Syst. Conch., t. 69, f. 51).

? Subgenus BRACHYTREMA, Morris and Lycett, 1850.

Shell turreted, turbinate, solid, whorls nodose, costulate or cancellate, the last whorl large, ventricose, angulated; columella smooth, rounded, obliquely truncate at the base forming a short oblique canal, aperture obsoletely channeled above, lip thickened and usually exteriorly subvaricose. C. WRIGHTI, Cotteau (Pl. 19, fig. 8), 16 sp., Jurassic, Europe.

Has the general appearance of *Tectarius*, and I formerly referred it to that group; yet its anterior canal, and varicose lip remind one of *Cerithium*.

Subgenus VERTAGUS, Klein, 1753.

Canal long and strongly recurved, columella with an oblique median plication.

Rhinoclavis, Swainson, 1840, is a synonym.

Subgenus CAMPANILE, Bayle, 1884.

Shell very large; columella simple, or with plications throughout its length; aperture short; lip sinuous, oblique; canal strongly twisted.

C. LÆVE, Quoy and Gaim. is a typical living example of this group; which appeared in the upper Cretaceous and flourished during the Eocene period.

Subgenus BEZANCONIA, Bayle, 1884.

Suture strongly channeled, periphery continuous and detached. C. SPIRATUM, Lam. *Eocene of Paris basin.*

Subgenus BELLARDIA, Mayer, 1870.

Last whorl with a series of tubercles, separated by a narrow, partially closed transverse fissure. Fossil. C. JANUS, Mayer. Nummulite of Vincentin.

Subgenus CERITHINELLA, Gemmellaro. 1878.

Subperforate, very long, cylindrical or turreted, plicate, and spirally lined, growth lines recurved near the suture; aperture quadrangular with a very short canal, columella straight. Having the aspect of *Nerinæa*. C. ITALICA, Gemm. Jurassic of Sicily.

Subgenus PSEUDOCERITHIUM, Cossmann, 1884.

Shell elongated, narrow, multispiral, with axial ridges forming a sort of pyramid twisted on its axis; aperture entire, slightly twisted in front.

C. CONTORTUM, Deslongchamps. Jurassic of Normandy.

Subgenus TOMOCHILUS, Gemmellaro, 1879.

Subumbilicated, short, pupoid-conic, whorls cancellated; aperture rounded, oblique, channeled behind, dilated anteriorly, columella thick, forming a slight depression at the base.

C. DESLONGCHAMPSI, Gemm. Jurassic of Sicily.

Genus FASTIGIELLA, Reeve, 1848.

Perforate, elongated, turreted; whorls numerous. convex, with spiral riblets; aperture terminating in a short, slightly twisted canal.

One or two recent species occur in the West Indies, and several fossils from the Eocene of the Paris basin are also referred here.

Genus BITTIUM (Leach), Gray, 1847.

Shell elevated, with numerous granular whorls and irregular varices; anterior canal short, not recurved; inner lip simple, outer lip not reflected, usually with an exterior rib. Operculum four-whorled with central nucleus.

Animal with lanceolate foot, subtruncate in front; eyes placed at the external base of the rather long tentacles; operculigerous lobe with rudimentary expansions on the sides, siphon rudimentary.

Numerous small species inhabiting temperate waters.

Cerithiolum, Tiberi, 1869, and *Platygyra*, Mörch, 1860, are synonyms.

Section CERITHIDIUM, Monts., 1884.

Mouth somewhat rounded, scarcely showing any canal below. C. SUBMAMILLATUM, Rayn.

Genus POTAMIDES, Brongniart, 1810.

Imperforate, turreted, angulated, tuberculate, spiny, etc., and covered by a thick, olive-brown epidermis, apex often decollated; whorls numerous, narrow, the last short; aperture channeled in front, outer lip simple or thickened. Operculum corneous, multispiral.

Animal with subcircular foot, obtuse behind; eyes on the side of the tentacles at a third or half of their length; siphon usually fringed.

Middle tooth of the radula small with toothed margin, lateral tooth large, subrhomboidal, with a rostrated base and toothed margin, first marginal tooth narrow, with a slight posterior projection, second marginal tooth sometimes elongated and simple, sometimes with a large external wing (Pl. 19, fig. 2).

The type is a fossil, P. LAMARCKI, Brongniart.

Inhabits brackish and fresh waters, in Tropical countries, particularly swamps, and the mouths of rivers, where they frequently remain for long periods out of the water, and in the dry season

suspend themselves to mangrove roots, weeds, etc., by means of glutinous filaments proceeding from under their closed operculum (Pl. 19, fig. 6).

Subgenus TYMPANOTONOS, Klein., 1753.

Shell with angular, spinose whorls; columella twisted, canal short; outer lip broadly sinuated anteriorly, and less distinctly so posteriorly. Animal with fringed siphon. P. FUSCATUS, Linn.

Subgenus PYRAZUS, Montfort, 1810.

Whorls angular; aperture with a short anterior canal, prolonged posteriorly; outer lip thickened, expanded. Animal with fringed siphon. P. EBENINUS, Brug.

Subgenus PYRAZISINUS, Heilprin, 1886.

Combining the general characters of Tympanotonus and Terebralia, differing from the former in the non-canaliculate character of the aperture, and from the latter in the possession of a deep sinus in the labrum, which is effuse, thickened, and carried completely over to the labium, so as to enclose a round siphonal aperture, as seen in Terebralia.

P. CAMPANULATUS, Heilprin (Pl. 19, fig. 10). Tertiary, Florida.

Subgenus TEREBRALIA. Swainson, 1840.

Shell with exterior varices and corresponding interior teeth, surface spirally channeled; aperture channeled behind, with short anterior canal; lip curved, dilated in front and prolonged so as to partially close the canal; columella with strong plications corresponding to the teeth on the interior of the outer wall (Pl. 19, fig. 4).

P. PALUSTRIS, Brug., occurs in great numbers in the salt marshes of the Eastern Archipelago, and is assiduously collected by the natives, who roast them and suck the contents of the shell through an aperture made by breaking off the tip of the spire.

The internal teeth do not approach the aperture, and are only discovered by making a longitudinal section of the shell. They have not been found in any of the related groups.

The genus BROTIA, H. Adams, 1866, is founded on *Melania pagodula*, Gould, a Burmese species resembling in general form *Terebralia Humboldti*, Val. Adams says that it has a multispiral operculum, and therefore places it under the above name in the Cerithiidæ. I agree with Dr. Brot that the species has so com-

pletely the aspect of a Melanian that it is very probable Adams was deceived as to his operculum really belonging to it.

Section Gourmya. Bayle, 1884.

No internal plications or tubercles; outer surface smooth.

Section Ditretus, Piette, 1874.

Turreted, with longitudinal rows of tubercles; outer lip thickened, prolonged below so as to close the canal—which is short, inner lip spread out, callous. P. rostellaria, Buv. Jurassic.

Subgenus Telescopium, Montfort, 1810.

Shell conical or trochoidal, of numerous flat whorls, the aperture subquadrangular, short, not channeled behind; lip thin, sinuous, prolonged at the base; columella interiorly plicate, plication visible near the suture.

P. telescopium is so abundant near Calcutta as to be used for burning into lime; great heaps of it being first exposed to the sun, to kill the animals. In Borneo it is an article of food.

Subgenus Vicaria, d'Archiac, 1854.

Turreted, spirally striated, with a row of tubercles next below the suture; canal very short, recurved, inner lip callously thickened, the callosity prolonged behind, where the aperture is channeled; outer lip strongly sinuated posteriorly.

P. Verneuili, d'Arch. Nummulite, India.

Subgenus Pirenella, Gray, 1847.

Shell turriculated, granose, with irregular ribs and varices; aperture rounded, terminating in a short anterior canal; inner lip simple, outer lip thin, sinuous. P. mamillatus, Phil.

Subgenus Cerithidea, Swainson, 1840.

Turriculated, longitudinally ribbed; whorls numerous, apex more or less truncated; aperture rounded, slightly transversely slit anteriorly; outer lip expanded, thickened, broadly rounded below and usually produced into a beak, crossing the sinus to the left. Eye pedicels long and thick, connate with the tentacles nearly to their tips.

They are so commonly out of the water as to have been taken for land shells. P. decollatus, Linn.

Section Aphanistylus, Fischer, 1884.

Shell decollated, thin, last whorl carinated; lip not dilated, nor

prolonged in front. Ocular peduncles long, tentacles not visible. P. CHARBONNIERI, Petit (Pl. 19, fig. 5.). Von Martens suspects that the ends of the tentacles are bent back when the animal is at rest so as to become invisible; at least this is the case in *Potamides obtusus* (*Archiv fur Naturgeschichte*, li, 48).

Subgenus LAMPANIA, Gray, 1846.

Turriculated, a little curved, whorls without varices; aperture subtruncate at the base, with a scarcely distinct, straight canal; lip sinuous. P. ZONALE, Lam. *China.*

Batillaria, Cantor, 1842, is the same, and has priority; but *Lampania* is well established, and need not be changed.

Section LAMPANELLA, Mörch, 1876.

Shell small, decussated. P. MINIMUS, Gmel.

Subgenus ESCOFFIERIA, Fontannes, 1880.

Turriculated, narrow, whorls numerous, subsolute; aperture subcircular, with sharp lip, columella excavated, canal obsolete. P. FISCHERI, Fontannes. Upper Tertiary of the Rhone basin.

? Genus SANDBERGERIA, Bosquet, 1860.

Shell small, ornamented like *Bittium*, with a rudimentary broad, shallow, short canal, lip curved, prominent at the base, columellar extremity surrounded by a basal fasciole. Operculum said to be coucentric and calcareous, but there is some doubt about this: if it is so, the group is certainly out of place in Cerithiidæ. S. ANTECEDENS, Stol. Tertiary.

Genus DIASTOMA, Desh., 1848.

Turriculated, with numerous ribs and a few varices; inner margin of the aperture partially detached from the previous whorl, the aperture is strongly contracted posteriorly, sinuous and subangular, but not channeled at the base, channeled behind, columella concave, simple.

D. VARICULOSUM, Desh. (*Struct. and Syst. Conch.*, t. 72, f. 50), Eocene.

? Genus MESOSTOMA, Desh., 1861.

Subrimate, elongated, turreted; aperture nearly circular, dilated, oblique, terminating in front by a semicanaliculated angle; columella slightly concave, lip simple, slightly expanded.

M. GRATUM, Desh. Eocene, Paris basin.

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? Genus EXELISSA, Piette, 1860.

Shell small, elongated, subcylindrical, somewhat pupiform, many whorled, longitudinally costate, tuberculate, or spinose, last whorl tending to separate from the axis, contracted at the base; aperture orbicular, entire, the lip produced and slightly thickened, columella solid. *Kilvertia*, Lycett, 1863, is a synonym.

E. FORMOSA, Lycett (*Struct. and Syst. Conch.*, t. 69, f. 62). Oolite, *England.* A doubtful member of the family.

? Genus PTEROSTOMA, Deshayes, 1861.

Shell small, turreted, subcylindrical, whorls numerous, with longitudinal tubercular ribs, and spiral striæ; aperture circular, entire, margin dilated, exteriorly thickened.

P. TUBA, Desh. (*Struct. and Syst. Conch.*, t. 72, f. 42). Eocene, Paris basin.

Genus CERITHIOPSIS, Forbes and Hanley, 1853.

Small, imperforate, more or less cylindrical, narrow, tuberculate, not varicose; whorls numerous, the last narrower in proportion; aperture small, with a short, truncate, nearly straight canal. Operculum suboval, paucispiral, with sublateral, internal nucleus. Animal with a narrow foot, subtruncated in front and attenuated behind, with a longitudinal sulcus on the sole; tentacles cylindrical, the eyes sessile at their base; opercular lobe simple, well developed.

Radula with an oval central tooth, its margin dentate, a large, bicuspid lateral tooth, and unicuspid laterals with smooth margin. Mostly occurring in northern and temperate seas. Fossil, Cretaceous.

C. TUBERCULARIS, Mont.

Section METAXIA, Monts., 1884.

Base truncate, basal area not cingulate and concave, canal open, incipient. C. RUGULOSA, Sowb.

Section SEILA, A. Ad., 1861.

Shell with simple spiral ribs. C. DEXTROVERSA, Ad. and Reeve. *Cinctella*, Monts., is a synonym.

Section LOVENELLA, O. Sars., 1878.

Shell subulate; whorls numerous, cancellated, aperture terminating in a short, distinct, reflected canal. C. METULA, Lovën. *Northern Seas.*

Cerithiella, Verrill, 1882, is a synonym.

Section EUMETA, Mörch, 1868.

Lateral and marginal teeth of the radula finely pectinate. C. ARCTICA, Mörch. *Northern Seas.*

Subgenus LÆOCOCHLIS, Dunker and Metzger, 1874.

Shell sinistral, elongated, granose, canal twisted. L. GRANOSA, Wood. *Boreal Seas.*

The dentition of this species is as near that of *Trichotropis* as *Cerithiopsis*, and von Martens has put it in Trichotropidæ; but the affinities of the shell appear to be Cerithid.

Genus CERITELLA, Morris and Lycett, 1850.

Shell small, smooth, with sharp spire and flattened whorls, the last whorl large, ventricose; aperture elongated, oblique, narrow, terminating in a very short canal, slightly turned outwards, lip thin, columella smooth, rounded, subreflected at the base.

C. ACUTA, Morris and Lycett (*Struct. and Syst. Conch.*, t. 60, f. 57). Jurassic. *England.*

Section TUBIFER, Piette, 1856.

Shell formed like *Actæon*, the last whorl cylindrical, large; aperture long, the lip thin, simple, descending as far anteriorly as the canal; canal long, thin, tube-like.

C. NUDA, Piette. Jurassic.

Costellifer, Meek, 1863, may probably be referred here.

Section FIBULA, Piette, 1857.

Shell elongated; columella straight with a rudimentary umbilical groove near the base; outer lip notched at the suture; base of aperture with a slight canal, or rounded and entire, depending upon its age.

C. UNDULOSA, Piette (*Struct. and Syst. Conch.*, t. 60, f. 56). 21 sp. Jurassic to Cretaceous; *Europe, India.*

Genus EUSTOMA, Piette, 1855.

Shell when young resembling Cerithium; in the adult there is a long, narrow, nearly straight anterior canal, and an ascending posterior channel, the lip is dilated, and there is a large spreading columellar callosity.

E. TUBERCULOSUM, Piette (Pl. 19, fig. 7). Jurassic.

Genus TRIFORIS, Deshayes, 1824.

Shell elongated, sinistral, granular; whorls numerous; aperture

small, with tubular, short, anterior canal. Operculum paucispiral, with subcentral nucleus.

Animal with elongated foot, truncated in front, where it forms a duplicature, the upper margin (mentum of Lovén) less developed than the lower; tentacles long, cylindrical, united by a sinuated veil, eyes at their exterior base; snout very short; operculigerous lobe simple.

Dentition (Pl. 10, fig. 3).—Central tooth very short, transverse, multicuspidate; lateral tooth also transverse and multicuspid; marginals four, small, transverse, simple (4·1·1·1·4).

About a hundred living species are known, all quite small, inhabiting the West Indies, Europe, Indian Ocean, Polynesia. Fossil. Tertiary. *Tristoma*, Blainv., 1825, is a synonym. The Triforis often attains a considerable size before losing its larval characters, particularly when distant from the shore. Dr. Fischer has captured on the high sea, between Provence and Corsica, a *T. perversa*, of which the shell had eight or nine whorls, yet the animal still retained its larval vellum.

An anomaly of the shell is the occasional preservation of a second canal upon the back of the body whorl, showing the termination of a former aperture. This is present in the fossil species upon which Deshayes established his genus, and which is named from this character. Dr. Jousseaume, in his recent monograph of the group, divides the species according to the presence or absence of this posterior opening, and creates certain new groups, of his division having three apertures, which he admits are identical in other characters with the sections *Ino* and *Mastonia* of Hinds, which he places among those having two apertures. Having examined several species with three apertures I incline to the opinion that the posterior canal is only accidentally preserved in some cases by reason of its deflection, which causes its tube to be surrounded with shelly matter during the growth of the shell, and that it bears no relation to the economy of the animal. This view is fortified by the consideration that neither in this group nor in any other group of the mollusca are we acquainted with any organ which might occupy or occasion this tube for the purposes of its economy. Moreover, in one of the species before me two individuals possess the third opening, whilst two others have it not. In consequence of this view I relegate Dr. Jousseaume's groups *Iniforis* and *Mastoniæforis* to the synonymy of *Ino* and *Mastonia* respectively.

Section TRIFORIS (sensu stricto).

Shell longitudinally ribbed, with one or two spiral lines; aperture round, entire; canal closed.

T. PLICATA, Desh. Eocene, Paris basin.

The genera *Trituba*, *Stylia*, *Euthymia* and *Metalepis*, Jousseaume, 1884, are synonyms.

Section INO; Hinds, 1844.

Shell cylindrically subulate, elongated, with flattened whorls, tuberculated in spiral series, spire sharp-pointed; aperture entire, margin continuous.

T. CORRUGATA, Hinds. *Inella*, Bayle, 1879, was proposed because *Ino* has been used twice in Entomology, but I see no occasion for making the change for such reason at this late day. *Iniforis*, Jousseaume, 1884, is a synonym.

Section MASTONIA, Hinds, 1844.

Shell swollen in the middle, contracted and rounded at the base, tuberculated usually in two spiral series. T. VULPINA, Hinds. *Mastoniæforis*, Jousseaume, 1884, and *Monophorus*, Grillo, 1877 (=*Biforina*, B. D. D.), are synonyms,

Section VIRIOLA, Jousseaume, 1884.

Shell with strong smooth, spiral ridges and channels; last whorl flattened and angulated at the base. T. BAYANI, Jouss. Jousseaume makes *C. dextroversa*, Ads. and Reeve, the type of his group, but that species is already the type of *Seila*, A. Ad., a section of *Cerithiopsis*. The sculpture of the two groups is the same, but one is dextral, the other sinistral; I prefer to limit *Viriola* to the sinistral shells.

Section SYCHAR, Hinds, 1844.

Elongated, with rounded whorls. T. VITREA, Hinds.

Genus CERITHIUM, Adanson, 1757.

Subgenus CERITHIUM (sensu stricto).

C. NODULOSUM, Brug. Pl, 19, figs. 13, 14; Pl. 20, fig. 15.

Ribs and tubercles crossed by spiral ridges and sulci, becoming coarser on the base; whitish or greyish, maculated and spotted with chestnut and chocolate color. Length, 3–4 in.

Singapore, Moluccas, Philippines.

It is *C. tuberosum*, Dillw., and *C. aluco*, Born (not Linn.).

C. ERYTHRÆONENSE, Lam. Pl, 20, fig. 16.

Shell smaller than *C. nodulosum*, with similar but neater sculpture; greyish with numerous small chestnut spots more or less confluent into longitudinal streaks. Length 2·5–3 in.

Red Sea.

I suspect that this will prove a synonym or at least only a variety of *C. nodulosum*. The synonyms are *C. striatum*, Schrœter, and *C. tuberosum*, of Reeve and Sowerby. The latter name being preoccupied by Grateloup for a fossil species, Bayle has changed it to *C. omissum*.

C. COLUMNA, Sowb. Pl. 20, figs. 17–20.

Shell with usually alternate larger and smaller spiral ridges, the larger ones more or less tuberculate, and both crossing somewhat distant pinched up longitudinal ribs; greyish, between the ribs with chestnut or chocolate dots and lines more or less confluent, interior sometimes white, sometimes chocolate-lined on the spiral ridges. Length, 1–1·5 in.

Mauritius, Philippines—Central Polynesia.

It is *C. echinatum*, Kiener, *C. Menkei*, Desh. (fig. 19), from *I. of Bourbon.*

Var. SCABRIDUM, Reeve (not Phil.). Fig, 20.

Smaller, striæ scabrous, canal shorter and more open.

Red Sea.

C. CITRINUM, Sowb. Pl. 20, figs. 21–23.

Solid, spirally striated, with distant, large, rounded longitudinal plaits, last whorl with a single varix, rounded below, canal long and curved; whitish, clouded with citron color. Length, 1·5 in.

Philippines.

I think that *C. siphonatum*, Sowb. (fig. 23), will prove synonymous; *C. bicolor*, Hombr. et Jacq. (fig. 22), also appears to be identical, or at least only a variety; finally the whole are probably mere varieties of *C. columna.*

C. SUTURALE, Phil. Pl. 20, fig. 24.

Longitudinally nodulosely ribbed, crossed by spiral lines, outer lip crenulated; whitish, with a chocolate sutural band. Length, 1 in.

Philippines.

C. ECHINATUM, Lam. Pl. 20, figs. 25–27.

Covered by revolving riblets, some of them bearing strong, pointed series of nodules, others alternately larger and smaller and unarmed,

usually five rows of nodules on the body whorl, outer lip fimbriated; white, with scattered or close chestnut dots or lines.
Length, 1·5–2·5 in.

Society and Paumotus Is.

C. mutatum, Sowb., is a synonym, and *C. Adansonii*, Reeve (fig. 27), not Brug. = C. tuberculiferum, Pease, is a narrow form, scarcely entitled to varietal designation. *C. album*, Hombr. et Jacq. (fig. 26), is a form with the tubercles only slightly developed; occasionally the face of the body whorl is almost devoid of them.

C. RUPPELLII, Phil. Pl. 20, figs. 28, 29.

Much narrower than the preceding species, the whorls somewhat shouldered, the tubercles small and rounded; whitish, spotted and marbled with chestnut. Length, 1·75 in.

Red Sea.

Reeve's figure (fig. 28) is somewhat abnormal. *C. Savignyi*, Fischer (fig. 29), and *C. alucoides*, Brocchi, are synonyms. This is *C. scabridum*, Philippi, but not of Reeve.

C. ADENENSE, Sowerby. Pl. 20, fig. 30.

Shell narrow, longitudinally distantly ribbed, with spiral riblets, two of which bear tubercles on crossing the ribs, tumid and tuberculated at the suture, then excavated; white, sparingly marbled with chestnut. Length, 22 mill.

Aden.

This may be a young specimen of the preceding species.

C. ARMATUM, Phil. Pl. 20, figs. 31, 32; Pl. 21, fig. 33.

Shell narrow, augur-shaped, the whorls with a series of large nodules next the suture, and three series of small papillæ beneath on the body whorl, a varix on the latter, and a few others near the apex; pale yellowish brown, spotted with chocolate.
Length, 1·25 in.

Philippines.

C. nigropunctatum, Sowb. (fig. 33), appears to me to be the juvenile of this species.

C. NOVÆ-HOLLANDIÆ, A. Ad. Pl. 21, fig. 34.

Shell narrow, with flexuous longitudinal plaits, somewhat tumid near the suture, merging below on the last whorl, into three spiral series of tubercles; aperture crenulated within; whitish, variegated with chestnut on the lower half of each whorl. Length 1·5 in.

Australia.

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C. FILOSUM, Sowb. Pl. 21, fig. 35.

Longitudinally plicate, with three spiral rows of rather large rounded tubercles, and an intermediate smaller row, interstices narrow; white, with chestnut lines between the ribs. Length, 22 mill.

Philippines.

C. CORALLINUM, Dufresne. Pl. 21, fig. 36; Pl. 24, fig. 46.

Shell with strong, rounded longitudinal ribs, crossed by spiral riblets and intermediate striæ, the intersections tuberculated, aperture crenulated within; chocolate brown. Length, 40 mill.

Philippines.

C. SCULPTUM, Pease. Pl. 21, fig. 37.

Shell spirally, nodulosely ridged, obsoletely longitudinally ribbed, regularly and evenly engraved throughout with close-set lines; whorls flatly convex; canal rather long and oblique; white, apex tinged with violet. Length, 1·25 in.

Paumotus Is.; Tahiti.

I am inclined to consider this identical with, and a synonym of *Vertagus torulosus*, Linn., but retain it here on account of some lingering doubts about it.

C. VULGATUM, Brug. Pl. 21, figs. 38–47.

Shell with distant, spiral, nodulose ribs, one row of nodules on each whorl more prominent, between the ribs are fine, close, engraved striæ; color variegated with grey, and chocolate or chestnut in undulating strigations and spots, interior similarly colored, the lips often tinged with orange brown. Length, 1–3 in.

Southern Europe, West Africa, Cape of Good Hope (Challenger Exped.).

The synonymy, including varietal names is enormous. I do not think the species varies more than is usual in the genus, and I am not disposed to recognize the so-called varieties as having any real claim to separation from the type; however, as they are admitted by some European naturalists of the "modern school" I figure a number of them.

Locard identifies this species with *Strombus tuberculatus*, Linn.; to this may be added, among other names *C. subnodosum*, Adams (fig. 39), from a worn and somewhat aberrant form, *C. Moluccanus*, Renieri, *C. alucoides*, Olivi, *C. Goumier*, Adanson, *C. nerinaceus*, Renieri, *C. Milne-Edwardsii*, Calcara. *C. modosus*, Schröter, *C. aluco*, Marschlius, and the following "varieties":

Var. *nodulosa*, Phil., var. *provinciale* (sp.). Locard, var. *alucaster*, Brocchi (fig. 40), and var. *plicata*, Phil. (fig. 49), which is the same form, var. *subvulgatum* (sp.), Locard, and its synonym, *C. spinosa*, Blainv. (fig. 41), var. *Bourguignati* (sp.), Locard, and its synonyms, *C. tuberculata*, Phil., *C. alucaster*, Scacchi, and *C. intermedia* and *C. minima*, Weink., var. *Servaini* (sp.), Locard, var. *mutica*, Bucq. Dautz. et Dollf. (fig. 42), var. *angustissima*, Weink. = *C. stenodeum*, Locard, var. *protractum*, Bivona, and its synonym var. *gracilis*, Phil. (fig. 43), vars. *hirta*, *seminuda* (fig. 45) and *longissima* (fig. 44) of Bucq. Dautz. et Dollf., var. *inscriptum*, Monts, (for var. *repanda*. B. D. D., not Monts., fig. 46), var. *repanda*, Monts., vars. *albina*, *citrina* and *melania*, Monts., var. *minuta*, de Serres, var. *pulchella*, Phil. (fig. 47).

C. RUPESTRE, Risso. Pl. 21, figs. 48–50.

Shell spirally engraved, with subnodulous oblique longitudinal low riblets, stronger at the suture and fading out below; greyish, numerously spotted and striped with chestnut. Length, 1 in.

Mediterranean Sea.

Always smaller, smoother and less angulated than the preceding species; the painting has frequently a minutely tessellated appearance. The synonyms are *C. lividulum*, Risso, *C. fuscatum*, Costa, *C. Mediterraneum*, Desh., *C. tuberculatum*, Blainv., *C. variegatum*, Menke, *C. doliolum*, Weink., *C. verrucosum*, Renieri. As in the case of *C. vulgatum*, several species and varieties have been manufactured out of forms of this shell, such as var. *strumaticum* (sp.), Locard = *C. tuberculatum*, Blainv. = var. *plicata*, B. D. D. (fig. 49), var. *Massiliense* (sp.), Locard = var. *minor*, B. D. D. (fig. 50), and var. *attenuata*, B. D. D.

C. ADUSTUM, Kiener. Pl. 21, figs. 51, 52.

Whorls angulated and tuberculated above, with sometimes two or three inferior rows of small tubercles on the body whorl, closely spirally striate, the striæ sometimes granose; columella with a heavy posterior callus; whitish, obscurely clouded with grey, with more or less interrupted chestnut or chocolate spiral lines and maculations. Length, 1·5–2·25 in.

Gallapagos Is., Panama to Mazatlan.

The synonyms are *C. nebulosum*, Sowb. (fig. 51), *C. maculosum*, Kiener. In the typical *C. adustum* the tubercles are obsolete, so that the shell is nearly smooth.

C. CÆRULEUM, Sowb. Pl. 21, fig. 54.

Solid, ventricose, finely spirally striate, with several spiral rows of tubercles on the body whorl, the upper ones larger, and forming an angle or shoulder; ashy grey, maculated with chocolate. Length, 40 mill.

Red Sea, Indian Ocean.

C. GUINIACUM, Phil. Pl. 22, figs. 55, 56.

Lightly spirally striated, with large, distant, rounded, longitudinal plicæ, tumid near the suture, fading out on the body whorl; whitish, under a yellowish corneous epidermis. Length, 34 mill.

Gabon country, W. Africa (Philippi).

In Reeve's Iconica the habitat of this species is said, on the authority of Cuming, to be "Lord Hood's Island, coast of Guinea"!

C. SANDWICHENSE, Sowb. Pl. 22, fig. 58.

Whitish, spirally lirate, crossing strong, rounded longitudinal ribs; whorls 9, convex, suture margined. Length, 27 mill.

Sandwich Islands.

Described from a single, not fully matured specimen. Appears related to the preceding species.

C. AEMULUM, Sowb. Pl. 21, fig. 53.

Shell turreted, with distant pinched up plications, and revolving striæ, appearing as though tessellated; yellowish white, with concentric reddish or violaceous lines; Length, 45 mill.

Cape Verd Is.

The specimens obtained were fossilized but retained their color; and the shell is probably still living in the neighboring waters.

C. TESSELLATUM, Sowb. Pl. 22, fig. 59.

Shell minutely regularly tuberculated, whitish, with chestnut colored small tessellations, outer lip thick, crenulated. Length, 22 mill.

Darnley's Isl., N. Australia.

C. CIRCINATUM, A. Ad. Pl. 22, fig. 57.

Dark chocolate color, with filiform spiral, white grooves, rather nodose between the grooves, distantly longitudinally plicate. Length, 22 mill.

Isl. Mindanao, Philippines.

C. UNCINATUM, Gmel. Pl. 22, figs. 60, 61.

Shell with a superior row of pointed tubercles forming an angle on the whorls, and two series of small nodules below, on the body

whorl; white, mottled with chestnut and ornamented by punctured lines, the large tubercles black tipped. Length, 1 in.

West Indies (Mörch, Sowb., etc.); *West Coast of N. Amer.* (Carpenter, Adams, etc.).

This species I have not seen, but from the figure it appears to be very close to, perhaps a spinose variety of the West Indian *C. eburneum*, Brug. Mörch included it in his West Indian catalogue and refers it to the MS. name *C. Antillarum*, Dunker. On the other hand, Carpenter includes it among his Mazatlan shells and considers *C. famelicum*, Ad., an unfigured species from Panama, a synonym; he has described a var. *mediolæve*.

C. LITTERATUM, Born. Pl. 22, figs. 63, 64.

Shell with close granular, spiral striæ, narrowly shouldered by a row of tubercles; white, the interstices of the granules chestnut or chocolate spotted. Length, 1–1·5 in.

West Indies, Florida.

It is *C. angustum*, Anton.

C. MUSICUM, Sowb. Pl. 22, fig. 65.

Rudely plicate, forming a concave shoulder on each whorl; white, with music-like chocolate lines and spots. Length, 1 in.

Habitat unknown.

C. SEMIFERRUGINEUM, Lam. Pl. 22, figs. 66, 67.

Spirally, granosely striated, with a pair of stronger tuberculated riblets in the middle of the body whorl, and a still stronger subsutural row, extending to the spire whorls; yellowish white, irregularly maculated and spotted with orange, chestnut or chocolate color. Length, 1–1·5 in.

West Indies.

C. pictum, Wood (fig. 67), is a synonym.

C. ATRATUM, Born. Pl. 22, figs. 68–70.

Shell with a sutural row of small nodules, succeeded by a row of larger ones, and below it, on the body whorl, about four rows of slight granules, between each row several close incised spiral lines, body whorl with a varix opposite the aperture; greyish, more or less clouded with chocolate, often almost entirely covered by varying shades of the latter; when the shell is dark the aperture becomes violaceous-blue. Length, 1–1·5 in.

West Indies, Florida.

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C. caudatum, Sowb. (figs. 69, 70), is a synonym; Mörch makes of it a var. *tenuis*. I think that the unfigured *C. Floridanum*, Mörch, may also be referred here.

C. EBURNEUM, Brug. Pl. 22, figs, 61, 71–75, 77–80.

Shell granose or tuberculated, one row of tubercles stronger, forming an angle on the middle of the spire whorls; between the tubercles are spiral fine striæ, finely spotted with chestnut or chocolate; sometimes the whole shell is pure white; there are generally occasional varices; interior of aperture marked like the exterior.

Length, 1 in.

Florida, West Indies.

The synonyms are *C. semiferrugineum* of Mörch (Yoldi Cat.) = var. *solida*, Mörch, *C. umbonatum*, Sowb. (fig. 62), *C. Novæ-Hiberniæ*, A. Ad. (figs. 73, 74), said, notwithstanding its name, to come from Florida, *C. fenestratum*, Sowb. (fig, 75), *C. graciliforme*, Sowb. (fig. 77), *C. pulicarium*, Phil. (fig. 77a), *C. striatissimum*, Sowb. (figs. 78, 79), and *? C. planispiratum*, Sowb. (fig. 80).

C. ALGICOLA, C. B. Adams. Pl. 22, figs. 82, 81.

Closely, longitudinally plicate, crossed by spiral striæ, forming small tubercles, whorls concavely shouldered; white, variegated with fulvous. Length, 20 mill.

West Indies.

I am not acquainted with this species. Mörch refers to it doubtfully, *C. punctulatum*, Gmel., *C. litteratum*, var. *parva*, of Kiener, and he adds vars. *vittata* and *tenuis*. *C. lentiginosum*, Sowb. (fig. 81), appears to be very like this species; it is described without locality.

C. MUNITUM, Sowb. Pl. 23, figs. 82–84.

Whorls flattened, varicose, with rude longitudinal plaits, crossed by spiral costulations, two spiral rows on the middle of the body whorl, strongly tuberculated; yellowish white, stained and lined with light chestnut. Length, 1 in.

Philippines, Viti Islands.

Reeve's locality "Mediterranean" and his reference to Philippi as authority are erroneous. With this species I unite as a synonym *C. pyramidatum*, Hombr. et Jacq. (fig. 84), a name preoccupied by Deshayes for a fossil species, and changed to *C. proditum* by Bayle, and which the latter author, having previously used this specific name in the same paper to designate another species, finally changed to *C. Audouini*.

C. SPATHULIFERUM, Sowb. Pl. 23, fig. 86.

With distant, longitudinal and spiral riblets the intersections forming two revolving rows of strong tubercles on the spire whorls, three on the body—one of which is above and two below the periphery, tubercles flattened; yellowish white or ash color.

Length. 1·25 in.

Hab. unknown.

Probably a variety of the preceding species.

C. OPPORTUNUM, Bayle. Pl. 23, fig. 85.

Shell distantly costate, so as to appear many-sided, crossed by somewhat distant spiral riblets, the body whorl with two larger ribs, on the periphery and below it; ashy gray, Length, 2 in.

N. Australia.

The name has been recently proposed instead of *C. polygonum*, Sowb., preoccupied by Leymerie for a fossil species.

C. DIALEUCUM, Phil. Pl. 23, figs. 88, 87.

Nodose, crossed by riblets and intermediate fine striæ; yellowish white or whitish, with narrow chestnut or chocolate bands between the revolving riblets. Length, 1 in.

Philippines.

C. striatum, Hombr. et Jacq. (fig. 87), is a synonym.

C. PRODITUM, Bayle. Pl. 23, fig. 89.

Longitudinally plicate, tuberculated by the crossing of spiral riblets, whorls angular in the middle, the last with two beaded riblets below; whitish, stained with chestnut between the plications.

Length, 1 in.

Philippines.

Described by Sowerby under the name of *C. fusiforme*, a name preoccupied by Leymerie for a fossil species.

C. ROSTRATUM, Sowb. Pl. 23, figs. 90, 91.

Graceful, thin, white, longitudinally plicate and finely granosely ribbed, often minutely chestnut dotted between the granules; canal produced, usually stained with chocolate, Length, 15–22 mill.

Philippines, Viti and Sandwich Islands.

C. gracilis, Pease, is a synonym.

C. LISSUM, Watson. Pl. 23, fig. 92.

Longitudinally rather closely ribbed, cut and somewhat tuberculated by spiral striæ; brownish white, with a white varix on the body whorl. Length, 1 in.

Fiji Is.

C. CUSTOS, Bayle. Pl. 23, figs. 95, 96.

Turreted, whorls strongly, tubercularly shouldered, elsewhere granular, varicose; orange-brown, whitish on the tubercles.

Length, 23 mill.

Philippines.

Described by Sowerby as *C. coronatum*, a name preoccupied by Bruguiere for a fossil species. I have a suspicion that this will prove a denuded state of the next species.

C. PLANUM, Phil. Pl. 23, figs. 98, 99, 97.

Narrow, flat whorled, subcylindrical, distantly, rather indistinctly longitudinally plaited, last whorl crenulately ribbed on the periphery and somewhat concave below, canal produced; white, with a single band of chestnut on each whorl. Length, 15 mill.

Philippines, Viti Islands.

C. invaginatum, Gould (fig. 97), from the last named locality, is a synonym.

C. SALEBROSUM, Sowb. Pl. 23, figs. 100, 1.

Slightly, tuberculately shouldered, with a pair of granulated revolving riblets on the lower part of the body whorl, ribbed, crossed by spiral lines; yellowish brown. more or less tinged with chestnut between the ribs. Length, 1 in.

Lord Hood's Island.

I am almost certain that this is simply a more flourishing state of *C. custos*, and consequently identical with *C. planum*.

C. BALTEATUM, Phil. Pl. 23, figs. 2, 3.

Varicose and longitudinally ribbed, tuberculated, swelled above, narrowed near the suture. last whorl with two strong tuberculated ribs below the periphery, and contracted below them; whitish, with a narrow, central, orange brown band, or brownish with a central white band. Length, 23 mill.

Philippines.

This may be another state of *C. planum*, Phil.; it is at least very closely related to it.

C. RUBUS, Martyn. Pl. 23, figs. 4–9, 15.

Varicose, brownish or brownish white, the whorls longitudinally plicate and spirally striate, with three spiral rows of tubercles on the spire whorls and about seven rows on the body. Length, 1 in.

Ceylon; Singapore; Philippines.

C. serratum, Wood, *C. mitræforme*, Sowb. (figs. 5, 6), which varies in having a white sutural band, *C. eximium*, Sowb. (figs. 7, 8), *C. granosum*, Kiener (fig. 9), and *C. sordidulum*, Gould (fig. 15), are synonyms.

C. TENELLUM, Sowb. Pl. 23, figs. 10, 11.

Thin, nearly transparent, white or rose color, sometimes with rows of small chestnut spots, varices white, whorls with excavated shoulder, tuberculated more strongly at the suture and shoulder angle than elsewhere, canal short and open, outer lip single. Length, 21 mill.

Philippines.

C. MUSCARUM, Say. Pl. 23, figs. 12, 13.

Whorls convex, crossed by rounded ribs, with wider interspaces, spirally lirate, forming granules on the ribs, fine striæ between the liræ; whitish, chestnut colored or chocolate, with series of minute chestnut punctations, sometimes on the ribs, sometimes between them. Length, 20 mill.

Florida; Bahamas.

It is *C. notatum*, Menke.

C. OCELLATUM, Brug. Pl. 24, fig. 19.

Blackish, spirally punctate with white, under a thin, olivaceous epidermis, whorls slopingly concavely shouldered, with a single row of tubercles at the angle. Length, 1·5 in.

Gallapagos Is. to Mazatlan, Muscat, Madagascar.

The Pacific and West American localities furnish this shell numerously, but specimens are in the British Museum, from Madagascar, and in the Phila. Academy are others from Muscat, collected by Dr. Ruschenberger, U. S. N. *C. irroratum*, Gould, and *C. stercus-muscarum*, Val., are synonyms.

C. INFLATUM, Quoy. Pl. 23, figs. 16–18; Pl. 24, fig. 23.

Chocolate color, under a yellowish olivaceous epidermis, usually shouldered, varicose, and roughly longitudinally plicate, tuberculated by the intersection of spiral riblets, with intervening spiral engraved lines. Length, 22 mill.

Philippines.

C. Billeheusti, Petit (fig. 18), is probably, and *C. breviculum*, Sowb. (fig. 18), is almost certainly a synonym; *C. Metcalfei*, Sowb. (fig. 23), can be added to the list.

C. CARBONARIUM, Phil. Pl. 24, figs. 34, 24.

Thick, dark chocolate, sometimes yellowish banded below the middle, whorls with two spiral rows of large blackish tubercles, with five additional rows, of smaller size on the body whorl, interstices finely spirally engraved. Length, 1–1·25 in.

Japan, China, Philippines, Seychelles, etc.

This is *C. tuberculatum*, Born. (not Linn.) = *C. Bornii*, Sowb. (fig. 24), and *C. Tourannense*, Eyd. et Soul. Reeve's figure of *C. carbonarium* represents a *C. morus*.

C. PATULUM, Sowb, Pl. 24, figs. 20–22.

Irregularly varicose, covered by a strong brownish epidermis; longitudinally strongly plicate, encircled by two strong tuberculated ribs, with other smaller ones, and intermediate liræ on the body whorl, body whorl distorted, narrowed into a distinct channel below, lip lirate within. Length, 1 in.

Philippines, Viti Is.

C. gibberulum, Frauenf., and, I think, *C. pellucidum*, Hombr. et Jacq. (fig. 22), are synonyms.

C. TUBERCULATUM, Linn. Pl. 24, figs. 25–28.

Varicose, with irregular large tuberculated ribs, and revolving rows of granules, with fine engraved lines between them; whitish, greyish, or yellowish, the granules and tubercles tipped with chocolate, so that the surface appears as though encrusted with gems.

Length, 1 in.

Polynesia.

This species, though varying considerably, may be distinguished from all its allies by usually possessing a strong oblique varix on the back of the body whorl. It is more usually known under the name of *C. petrosum*, Wood. *C. Janelli*, Hombr. et Jacq., is another synonym.

Var. PUPA, Sowb. Fig. 28.

Whitish or light lilac, with a fulvous band at the suture, and another below the middle of the body whorl.

Philippines.

C. MORUS, Lam. Pl. 24, figs. 32, 33, 29–31, 35–37, 39, 40, 41, 43, 45, 47; Pl. 25, figs. 55, 57, 58, 65, 66.

Dark chocolate color, with a varix on the body whorl opposite the aperture, spire with three, body whorl with about seven rows of small black tubercles, with a single stria between each.

Length, 1 in.

Red Sea, Madagascar, Philippines, Australia, Viti Is., etc.

C. concisum, Hombr. et Jacq., *C. obscurum*, and *C. gemmulatum* (figs. 57, 58), of the same authors, *C. carbonarium*, Sowb., not Phil., *C. breve*, Quoy, and *C. moniliferum*, Dufresne (fig. 35), are synonyms.

Var. VARIEGATUM, Quoy. Figs. 41, 43, 45, 65, 66.

E. A. Smith, in the Mollusca of the Alert Expedition, refers *C. variegatum*, Quoy, to the preceding species; judging from the original figure, and a large series of specimens evidently identical with it, none of them having the varix on the back, I believe that it is a small variety of *C. morus*, averaging 15 mill. in length, tessellated or irregularly variegated with dark brown on the tubercles, the aperture often violaceous. As to the *C. variegatum* figured in Reeve's Iconica (figs. 29–31), that appears to represent variations of *C. morus* depending on the slight development of tubercles and lighter, blotched coloring, but is much closer to the type than Quoy's species.

C. humile, Dunker (fig. 66), *C. nivosum*, Sowb. (fig. 45), *C. gemma*, Sowb. (fig. 41), *C. Californiæ*, Sowb. (fig. 43), and *C. acutum*, Hombr. et Jacq. (fig. 65), are probably synonyms.

Var. PATIENS, Bayle. Figs. 36, 37, 47.

The longitudinal ribs more developed, making the tubercles larger and more irregular in development; yellowish white or greyish irregularly blotched and spotted with chocolate, sometimes chocolate color with whitish markings.

Polynesia.

A much rougher shell than the typical *C. morus*, the tubercles larger and the intermediate spiral striæ faint or obsolete. Usually recognized as a species, under the name of *C. rugosum*, Wood, which is preoccupied by Lamarck for a fossil species. The characters appear to merge gradually into those of the type. *C. tuberculatum*, of Reeve's Iconica, is a synonym, and *C. musivum*, Hombr. et Jacq. (fig. 47), is a small form of it.

Var. BIFASCIATUM, Sowb. Figs. 39, 40, 55.

White, with a chestnut band on the spire, and two bands on the body whorl.

Philippines.

Probably *C. vittatum*, Sowb. (fig. 55), changed by Bayle to *C. Uranus*, because of the fossil *C. vittatum*, Lam., is a depauperate young shell of this form. I add *C. nigrofasciatum*, Sowb. (fig. 40).

C. LEMNISCATUM, Quoy. Pl. 24, fig. 38.

Varicose, roughly granulated in revolving series, with usually single intermediate liræ, in the middle of each whorl a few of the granules are larger, more like tubercles; whitish, more or less speckled or clouded with chocolate, frequently with a chocolate band on the spire, and two bands on the body whorl. Length, 1·25 in.

Philippines, Viti Islands.

C. TRAILLII, Sowb. Pl. 25, figs. 47–54, 56, 59.

Varicose, with spiral beaded striæ alternating with smaller plain ones; yellowish white, or clouded with chestnut or chocolate, the beads chestnut or chocolate color. Length, 1·5 in.

Singapore; Java; Philippines.

Differs from the preceding species in its finer, more regular spiral sculpture, variegated coloring, and absence of tubercles: it is possibly only a variety of it. *C. nitidum*, Sowb. (fig. 54) = *gentile*, Bayle, and *? C. baccatum*, Hombr. et Jacq. (fig. 59), are synonyms.

Var. LUCTUOSUM, Hombr. et Jacq. Fig. 56.

Stouter and smoother, the granules more distant and fewer; nearly uniform white, the granules milk-white.

Var. ALTERNATUM, Sowb. Figs. 48–50.

The granules larger, spiny, shell white, or chocolate color, or white with interstitial bands of chocolate.

Philippines.

C. robustum, Sowb. (fig. 50), is a synonym.

Var. SPLENDENS, Sowb. Figs. 53, 51, 52.

Granules larger, spiny, one or more series more developed, so that the whorls apppear subangulate and the lip margin crenulated; whitish to chocolate color, on the lighter colored specimens the spines are chestnut colored.

Philippines.

C. purpurascens, Sowb. (figs. 51, 52), is a synonym.

C. HANLEYI, Sowb. Pl. 24, fig. 42.

Shell with rounded longitudinal plications, varicose, slightly noduled by spiral sculpture; yellowish brown, with regular chestnut or chocolate spiral lines. Length, 22 mill.

Hab. unknown.

C. rubrolineatum, Sowb. (figured), is precisely like *Hanleyi*,—which was first described of the two on the same page of the Thesaurus. Why Sowerby abandoned the latter name in favor of the former, I cannot imagine.

C. MILLEPUNCTATUM, Hombr. et Jacq. Pl. 25, fig. 60.

Varicose, with alternate spiral rows of faint nodules and intermediate striæ; whitish, with chestnut spots. Length, 22 mill.

Ins. Hogoleu.

I know nothing of this species, which it appears had become lost to the scientific world.

C. ASPERULUM, Tryon. Pl. 25, fig. 62.

Brown, slightly shouldered, longitudinally plicate, with spiral lines of chestnut colored nodules and minute intermediate striæ, nodules sharp, outer lip thickened crenulated. Length, 14 mill.

Sandwich Islands.

Mr. Pease called this species *C. asperum*, a name preoccupied in the Vertagus group.

C. ELUDENS, Bayle. Pl. 25, fig. 63.

Whorls angulated, ventricose, plaited at the angle, girt beneath the suture with a tuberculated line, body whorl biangulate, both angles tuberculated; fulvous, chestnut spotted between the tubercles. Length, 15 mill.

Tasmania.

Described by Sowerby as *C. dubium*, preoccupied by the Sowerby of the "Mineral Conchology."

C. USTUM, Hombr. et Jacq. Pl. 25, fig. 61.

Narrow, decussated by longitudinal and spiral sculpture, the former more prominent, aperture striate within, ribbed without, brownish. Length, 28 mill.

Solomon's Archipelago.

C. NIGROBALTEATUM, E. A. Smith. Pl. 25, fig. 64.

White, chocolate banded above the suture, and on the periphery of the last whorl; whorls 12, convex, strongly longitudinally ribbed and spirally ridged and sulcated. Length, 15 mill.

Prince of Wales' Channel.

C. TORRESI, E. A. Smith. Pl. 23, fig. 14.

Whitish, with spiral series of chocolate colored spots upon the liræ between the longitudinal granose ribs; whorls 11, very slightly convex; aperture with external varix and interior grooves. Length, 14·5 mill.

Prince of Wales' Channel, Torres Straits, Australia.

Resembles *C. muscarum*, Say, of the Southern United States' Coast.

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C. KOBELTI, Dunker. Pl. 25, fig. 67.

Yellowish brown, varicose, roughly nodulous, with decussating sculpture; whorls 8–9, convex. with deep suture; lip thickened, grooved within. Diam. 23 mill.

Japan.

C. ISSELII, Pagenstecher. Pl. 25, fig. 68.

Whorls 8, convex, decussated by close, fine longitudinal and spiral sculpture, brownish. Length, 22 mill.

Red Sea.

Unknown to me.

C. EGENUM, Gould. Pl. 25, fig. 70.

Whitish, with small brownish dots at the base; whorls about 10, nearly flat, spirally threaded, last whorl somewhat swollen, varicose. Length, 9 mill.

Wilson's Isl.

Reeve's figure does not represent this species.

C. IANTHINUM, Gould. Pl. 25, figs. 71, 72.

Light, violaceous, the suture, lip and varices white, with close, spiral, thread-like, somewhat granose striæ. Length, 9 mill.

Clermont Tonnere; Ins. Bourbon.

C. aspersum, Desh. (fig. 72), from the last-named locality, is a synonym.

C. MAILLARDI, Crosse. Pl. 25, figs. 73, 74.

Greyish white, with small interrupted dark spiral lines, whorls 11, convex, quadrisulcate and granular, with frequent varices. Length, 8 mill.

Ins. Bourbon.

I doubt whether this is distinct from the last species. It was first described by Deshayes as *C. Crossei*, a name preoccupied by Tiberi.

C. MACULOSUM, Mighels. Pl. 26, figs. 75, 76.

Club-shaped, with spiral striæ, and longitudinal wrinkles on the upper part of the whorls, which are a little concavely shouldered; shining white, irregularly blotched and spotted with chestnut or chocolate, sometimes covering most of the surface, at other times faint, and sparse. Length, 9 mill.

Sandwich and Viti Is.; Mauritius.

C. Nassoides, Sowb. (fig. 76), is a synonym.

C. DIMINUTIVUM, Phil. Pl. 26, fig. 77.

Turreted, with obsolete rounded longitudinal ribs, and fine spiral striæ, developing a line of tubercles on the shoulder angle; whitish, orange brown between the sculpture. Length, 7 mill.

Friendly Is.; Paumotus.

C. ZEBRUM, Kiener. Pl. 26, figs. 78–82.

Minutely, regularly granulated by fine decussating sculpture, white or fulvous, chocolate or chestnut banded at the suture and periphery, occasionally varicose. Length, 8 mill.

Gallapagos Is.; Samoan Is.

C. delectum, Sowb. (figs. 80–82), is a synonym; the whorls are sometimes rosy or dark, with minute spiral series of black specks.

C. ICARUS, Bayle. Pl. 26, figs. 83, 84.

Longitudinally plaited, spirally closely ridged, white, maculated with brown, often dark banded at the suture, and on the periphery of the last whorl, outer lip crenulated within. Length, 6·5 mill.

Loochoo and Bonin Is.

Described by Sowerby as *C. tenue*, preoccupied by Deshayes for a fossil species.

C. INTERSTRIATUM, Sowb. Pl. 26, fig. 85.

Granosely costulate, crossed by close spiral lines, whitish, with chestnut colored spots in spiral series. Length, 13 mill.

Hab. unknown.

C. UNILINEATUM, Pease. Pl. 26, fig. 86.

Slightly longitudinally ribbed, spirally striated, rather frequently varicose, whitish or yellowish, sprinkled with pale chestnut spots, with a sutural chestnut band. Length, 6 mill.

Sandwich Is.

C. FUCATUM, Pease. Pl. 26, fig. 87.

Pale fawn color, encircled by three series of nodules, between them spotted with chestnut, suture excavated, whorls occasionally varicose. Length, 10 mill.

Sandwich Is.

C. PAXILLUM, Pease. Pl. 26, fig. 88.

Brownish, longitudinally plaited, spirally tuberculated upon the plaits, and striated between the tubercles. Length, 6 mill.

Sandwich Is.

C. PLACIDUM, Gould. Pl. 26, fig. 89.

White, with rough spiral ridges and deep interstices, whorls flat, suture excavated. Length, 6 mill.

China Seas.

C. RARIMACULATUM, Sowb. Pl. 26, fig. 91.

Turreted, shouldered, spirally striated, the shoulder-angle tuberculated; white, with a few chestnut spots irregularly disposed.

Length, 10·5 mill.

Ins. Zebu, Philippines.

C. REPLETULUM, Bayle. Pl. 26, fig. 92.

Short, ventricose, grey tending to black, banded with dark spots and interrupted lines, whorls plaited above, aperture lirate and dark banded within. Length, 22 mill.

Ins. Bohol, Philippines.

Described by Sowerby as *C. obesum*—preoccupied by Deshayes for a fossil species.

C. OBESULUM, Sowb. Pl. 26, fig. 93.

Solid, blackish, slightly angularly elevated on the back of the whorls, with spiral series of beaded ribs, aperture whitish, lip crenated within. Length, 11 mill.

Hab. unknown.

C. FLAMMICULATUM, Sowb. Pl. 26, fig. 98.

Greyish, with chocolate between the spiral series of small nodules or grains. Length, 15 mill.

Hab. unknown.

C. ADUNCUM, Gould. Pl. 26, figs. 96, 97.

Solid, distorted, with a stout varix on the body whorl, rather smooth, with thin, thread-like spiral striæ; whorls 9, flattened, suture scarcely impressed; yellowish ash-color, tinged with brownish.

Length, 1 in.

Philippines.

C. dorsuosum, A. Ad. (fig. 97), is a synonym.

C. ALBOLIRATUM, Carp. Pl. 26, fig. 90.

Obsoletely ribbed, spirally lirate, one or two of the liræ more prominent, forming an angle on the whorls, whitish.

Length, 1–3 mill.

Mazatlan.

A very young species, probably a juvenile of some other species of our Pacific coast.

C. TROCHIFORME, Sowb. Pl. 26, fig. 95.

Trochiform, longitudinally plaited, tuberculated by the crossing of spiral sculpture, last whorl rather flat below, and less sculptured; chocolate color. Length, 3 mill.

California.

A juvenile, which I am unable to refer definitely to any form known to me. The locality needs confirmation.

C. FERRUGINEUM, Say. Pl. 26, figs. 99–5.

Orange-red to chocolate color, sometimes whitish on the lower half of the body whorl, sometimes variegated, with small, oblique, rounded ribs, cut into numerous tubercles by spiral grooves, lower half of body whorl less distinctly tuberculated, whorls occasionally varicose. Length, 12–15 mill.

So. Carolina to Florida; West Indies.

Var. VERSICOLOR, C. B. Adams. Figs. 100–5.

The West Indian examples of *C. ferrugineum* have received this name: they usually vary from the type in being parti-colored as above, and a little stouter in form. These differences are not very constant, *C. Eriense*, Val. (fig. 1), of which the figures in Reeve and Sowerby (copied by me) appear to be magnified representations, and which Mörch calls var. *major*, may be here referred, as well as *C. stercus-muscarum*, Kiener, *C. variabile*, C. B. Ads. (fig. 2) = var. *grisea*, Mörch, *C. nigrum*, Phil., *C. Bermudæ*, Sowb. (fig. 4), *C. Thomasiæ*, Sowb., *C. lutosum*, Menke (fig. 5).

C. RISSOIDÆ, Sowb. Pl. 26, fig. 6.

Small, whitish, spirally striated, longitudinally plaited, with small tubercles in three rows on the spire whorls, suture deep, last whorl alternately ridged beneath. Length, 7 mill.

Ins. St. Thomas, W. I.

A much smaller species than the foregoing, always white, or yellowish white.

C. SAGRÆ, d'Orb. Pl. 26, fig. 94.

Ovately ventricose, beaded in three spiral series on the upper whorls, more numerously on the lower one, the row immediately below the suture more prominent; whitish, longitudinally irregularly stained with chestnut. Length, 9 mill.

Cuba.

C. megasoma, C. B. Ad., is a synonym. Mörch mentions a var. *pallida*.

C. MUTABILE, C. B. Adams. Pl. 26, fig. 7.

Whorls convex, with a narrow shoulder under the suture, sculpture very faint, showing under the glass minute granulations and striæ, spirally disposed; white, variegated and blotched with chestnut, sometimes wholly chestnut; aperture large, the outer lip well rounded, thin. Length, 9 mill.

Salt Lakes, Bahamas.

C. CRASSILABRUM, Krauss. Pl. 27, fig. 17a.

Whitish, spotted and dotted with chestnut, ribbed, angulated above the middle of the whorls, with beaded spiral striæ; outer lip slightly expanded, crenulated, spotted. Length, 12 mill.

Cape of Good Hope.

C. SEROTINUM, A. Ad. Pl. 27, figs. 19, 20.

Whitish or pale brownish, longitudinally closely plicated, spirally striated, whorls ventricose in the middle, body whorl truncate below, canal contracted, short, columellar lip free.

Length, 12–18 mill.

Van Dieman's Land

C. rhodostoma, A. Ad. (fig. 20), is a synonym.

C. PAUXILLUM, A. Ad. Pl. 34, fig. 95.

Subcylindrical, pale fulvous, longitudinally plaited and spirally ribbed, the intersections nodulous, suture deep. Length, 9 mill.

Philippines.

Section COLINA, H. and A. Adams, 1853.

C. PINGUE, A. Ad. Pl. 26, figs. 8, 9, 11.

Finely, spirally striated, whorls tuberculated above the suture, body whorl plicate above; yellowish chestnut color, interior lined with chestnut. Length, 18 mill.

Cape of Good Hope.

Varies considerably in outline: *C. contractum*, Sowb. = *C. crumena*, Bayle (fig. 9), and *C. tæniatum*, Sowb. (fig. 11), being synonyms.

C. CYLINDRACEUM, Pease. Pl. 26, fig. 12.

White, with pinched-up, curved longitudinal distant ribs, and more numerous sutural crenulations, and minute, distant, bead-like spiral striæ, closer at the suture. Length, 23 mill.

Paumotus Is.; Viti Is.

C. MACROSTOMA, Hinds. Pl. 26, figs. 13–15, 10.

Pale fulvous, or whitish, thin, spirally striated, longitudinally ribbed, spire whorls more or less angulated in the middle, ribs less distinct on the body whorl, outer lip thickened. Length, 12 mill.

Borneo.

I unite with this species *C. costatum*, A. Ad. (fig. 13) = *C. costiferum*, A. Ad. = *C. rigens*, Bayle, *C. pupæforme*, A. Ad. (fig. 15), which, according to the form of the aperture, and sharp lip is not adult, and *C. pygmæa*, H. Ad. (fig, 10), the latter a more highly colored specimen.

C. BRAZIERI, Tryon. Pl. 26, fig. 16.

Subcylindrical, fragile, white, whorls angulated and tuberculated on the middle, finely spirally striate, longitudinally faintly costate, aperture prolonged below into a straight, sharp canal.

Length, 1 in.

Australia.

An aberrant form, almost deserving to be made the type of a new group. The extreme fragility and form of the mouth indicate juvenility. Mr. Brazier sent us several specimens, which all exhibit the above characters.

C. GRACILE, H. Adams (unfigured). *Eastern Seas.*

Mr. Adams says that this species was subsequently described by Mr. Sowerby under the name of *C. coaretata;* I have not found this latter description.

Section LIOCERITHIUM, Tryon, 1887.

C. INCISUM, Sowb. Pl. 27, fig. 22.

Shell with spiral incised grooves, whitish or grey, marbled with chocolate, sometimes articulated at the suture, interior white, grooved with chestnut. Length, 1 in.

L. California; Guaymas, Mex.

The localities Australia and Philippines, of the monographers, are incorrect.

C. CURTUM, Sowb. Pl. 27, fig. 23.

Shell similarly sculptured and colored as the preceding, but shorter and stouter. Length, 18 mill.

Cerros Is., L. California.

This may be a variety of the preceding species, but I have not seen intermediates. Bayle has changed the name to *C. Euros*, on account of *C. curtum*, H. C. Lea.

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C. INTERRUPTUM, Menke. Pl. 27, figs. 24, 25.

Form of the preceding species but more finely irregularly grooved, with intervening ridges; whitish, marbled or closely spirally lined with chocolate. Length, 12–15 mill.

Cape St. Lucas, L. Cal. to Panama; Gallapagos Is.

C. sculptum, Sowb. (fig. 24), is a synonym.

Var. GALLAPAGINIS, A. Ad. Fig. 25.

The spiral grooves crossed by slight, close longitudinal riblets, forming a somewhat beaded surface.

Guacomayo; Gallapagos.

C. NITIDUM, Hombr. et Jacq. Pl. 27, fig. 31 (lower).

Vitreous white, channeled, with a line of tubercles next below the suture, which are sometimes yellowish. Length, 1 in.

Mangareva Is.

C. BÆTICUM, Pease. Pl. 27, fig. 26.

Thin, with alternate shallow grooves and ridges, the former yellowish, the latter chestnut colored; these colors also appear in the aperture; the upper whorls are obscurely ribbed and nodulous.

Length, 6 mill.

Sandwich Is.

C. LINEATUM, Dunker. Pl. 27, figs. 27, 28.

Granulated by revolving ribs and intermediate grooves, and less prominent longitudinal sculpture; white, with two close, interrupted chestnut lines on the middle of each whorl. Length, 5 mill.

Viti Is.

C. MONACHUS, Crosse and Fischer. Pl. 27, fig. 21.

Rather thin, subtranslucent, reddish yellow, covered with minute chestnut markings; whorls 10, rounded, obtusely carinated, carina forming an articulated band, last whorl with two obtuse carinæ, spirally striated, occasionally varicose. Length, 18 mill.

Port Adelaide, Australia.

The authors consider the species a Cerithidea.

C. LACTEUM, Kiener. Pl. 27, figs. 29, 30, 33.

Spirally grooved, crenulated near the suture, or sometimes minutely granular; white, or yellowish white, sometimes with a row of subsutural chestnut spots, sometimes with obscure zigzag chestnut strigations. Length, 15 mill.

Sandwich and Viti Islands.

C. pusillum, Nuttall, is probably, and *C. papillosum*, Sowb. (fig. 33), is certainly a synonym.

C. PIPERITUM, Sowb. Pl. 27, figs. 31, 32.

Spirally ribbed and grooved, white, the ribs chestnut spotted, whorls angulated in the middle. Length, 18 mill.

Philippines; Polynesia.

C. punctatum, Brug., and *C. alveolus*, Hombr. et Jacq. (fig. 32), are synonyms.

Subgenus STILUS, Jeffreys, 1885.

C. INSIGNIS, Jeffreys. Pl. 26, fig. 17.

Rather thick, glossy, with numerous longitudinal ribs, crossed by three spiral striæ on each whorl, the intersections tubercular, periphery of body whorl ridged, base smooth and somewhat concave, white. Length, 6 mill.

Atlantic O. (Porcupine Exped.)

Unfigured and Undetermined Species of Cerithium.

The following are all described under the generic name of Cerithium, and are accordingly included here, although it is probable that some of them belong to other groups in the family.

C. STIGMOSUM, Gould. *Bonin Is.*

C. MINUTUM, Nuttall. *Sandwich Is*

C. ALABASTRUM, Mörch. *St. Thomas, W. I.*

C. RAWSONI, Krebs. Mörch. *Barbados, W. I.*

C. EPESCOPALE, C. ELONGATUM, C. FULVUM, C. FRAGILE, C. GRANULOSUM, C. GRACILE, C. IRREGULARE, C. MUREX, C. PAGODULA, C. PLATYNOTUM, C. PICTUM, C. RUBROPUNCTATUM, C. RUDE, C. CONICUM, C. CONULUS, C. VENTRICOSUM, C. TURRITELLA, all of Anton. *Local. unknown.*

C. SCABRICOSTA (*Loc. unknown*), C. TUBULUS (*Bass Sts.*), C. FUSCUM (*Navigator's Is.*), C. GIBBEROSUM (*Nicobar Is.*), all of Dunker.

C. DORSUOSUM, Menke. *Australia.*

C. VERSICOLOR and C. PUMILUM (*Hab. unknown*), C. GLABRATUM (*Australia*), C. FILOSUM (*California*), C. SPADICEUM (*Yucatan*), C. EXIGUUM (*Friendly Is.*), C. CECILLII and C. NEBULOSUM (*Loochoo Is.*), C. ANTARCTICUM and C. PULLUM (*Magellan's Sts.*), all of Philippi.

C. ABBREVIATUM (*N. Guinea*), C. BICANALIFERUM and C. MINIMUM (*N. Australia*), of Brazier.

C. GRACILENTUM and C. LACINIOSUM, Mighels. *Sandwich Is.*

C. VARIEGATUM, Folin. *Panama.*

C. CANCELLATUM, H. C, Lea. (Minute, perhaps not a Cerithium). *Delaware Bay.*

C. PROTEXTUM, Conrad. = *Terebra.*

C. GIGANTEUM, Lam. (Not Australian, but) Fossil. *Paris basin.*

C. DISLOCATUM, Say. = *Terebra.*

Subgenus VERTAGUS, Klein., 1753.

C. MACULOSUM, Martyn. Pl. 27, fig. 35.

White, marbled and longitudinally interruptedly marked with chestnut; earlier whorls longitudinally distantly ribbed. all the whorls with incised lines marking off alternately wider and narrower spiral interspaces, which, at the base, become rounded, rugose ribs.

Length, 5 in.

Gallapagos Is.

C. marmoratum, Quoy, *C. marmoreum*, Kiener, *C. magnum*, Jay, and *C. clava*, Brug., are synonyms.

C. SOWERBYI, Kiener. Pl. 27, figs. 36, 37.

Upper whorls irregularly ribbed and spirally striate, lower ones smooth, with a faint or obsolete shoulder of tubercles on each whorl; yellowish white with quadrangular chestnut spots in spiral series, overlaid by irregular chocolate blotches. Length, 3·5 in.

Philippines; N. Australia.

The pattern of coloring varies to yellowish white, with close irregular longitudinal chocolate blotches, and no rows of spots, they coalescing into the blotches; in this state,it is *C. Cumingii*, A. Ad. (fig. 37). It is *C. clava* of Sowerby's "Genera."

C, ALUCO, Linn. Pl. 27, fig. 38.

Whorls slightly angled and distantly nodose-spinose below the suture, upper whorls spirally ridged and cancellated, lower ones with an occasional, low spiral rib, otherwise smooth; white, thickly speckled, blotched and strigated with chestnut or chocolate.

Length, 2·5–3 in.

Philippines; Viti Isles.

Murex coronatus, Born, is a synonym.

C. OBELISCUS, Brug. Pl. 27, figs. 39, 40.

Whorls with tuberculated spiral ribs and intermediate granulated spiral striæ, the tubercles more prominent on a slight shoulder of each whorl; yellowish white, more or less thickly spotted and clouded with chestnut or chocolate; last whorl with an obtuse lateral varix. Length, 2–2·5 in.

East Indies, Polynesia, Mauritius.

It is *C. Sinensis*, Gmel. A smaller form, in which the sculpture is sharper has received the name of *C. cedo-nulli*, Sowb. (fig. 40).

C. CORDIGERUM, Bayle. Pl. 27, fig. 41.

Shell finely, closely, spirally striated, with a line of tubercles at the suture, and a second, less prominent series below it on the spire, two or three inferior distant riblets on the body-whorl; whitish or yellowish brown, the riblets of the body-whorl often articulated with chestnut. Length, 1·5 in.

Australia.

Notwithstanding the difference in the sculpture I suspect that this will prove to be a mere variety of *C. obeliscus*. It was described by Lamarck as *C. semigranosum*, but as that author previously used the same name for a different, fossil species, Bayle changed it as above.

C. PULCHER, A. Ad. Pl. 27, fig. 42.

Spirally striated, obsoletely longitudinally ribbed, with a row of nodules at the suture, and a varix on the last whorl; yellowish, with chocolate spots between the sutural nodules. Length, 2 in.

N. Australia.

C. GEMMATUM, Hinds. Pl. 28, figs. 44, 45; Pl. 27, fig. 43.

Spirally grooved, the interstices more or less tuberculated, a stronger band of tubercles next the suture, body whorl flattened in front, with a large lateral varix; yellowish white, marbled and spotted with chestnut or chocolate. Length, 1·5–2 in.

Mazatlan to Panama; Viti Islands; Australia; Indian Archipelago.

The West American localities are for the type, the others for *C. articulatum*, Ads. and Reeve (fig. 45), which I cannot separate even as a variety; *C. tenuisculptum*, Sowb. (fig. 43), is another synonym.

C. SEMINUDUM, Sowb. Pl. 28, fig. 46.

White, spirally grooved, whorls angulated above the middle, armed with three series of large, sharp tubercles, body-whorl without tubercles below. Length, 1·25 in.

New Caledonia.

C. TORULOSUM, Linn. Pl. 28, figs. 50, 52, 53.

Whitish, with noduliferous ribs, beaded and tumid at the suture, spirally ribbed, outer lip digitated. Length, 1·5 in.

Society Is.

It is *C. annulare*, Gmel., and *C. annulatum*, Mart.

C. RECURVUM, Sowerby. Pl. 28, fig. 47.

Spire whorls with three rows of granulations, seven rows on the body whorl; white, with chestnut spots between the nodules.

Length, 2 in.

Red Sea.

C. KOCHII, Phil. Pl. 28, figs. 48, 49.

Spire longitudinally ribbed, ribs cut into nodules by spiral incised lines forming alternately wider and narrower interspaces; the ribs are obsolete on the body whorl, which has a single sutural row of nodules; yellowish white more or less marbled or tinged with light brown, sometimes the incised lines are chestnut colored.

Length, 1·5 in.

E. coast of Africa.

C. GRANIFERUM, Pease. Pl. 28, fig. 51.

Yellowish white, suffused with pale brown, minutely brown-spotted between the granules; whorls with tuberculated ribs below the suture, then two distant, smaller spiral series of granules, interstices striated, body whorl rounded and granulated beneath.

Length, 1 in.

Sandwich Is.

C. RAVIDUM, Phil. Pl. 28, fig. 54.

Fulvous, irregularly varicose, longitudinally plicate and spirally striated, the ribs tuberculated, a stronger spiral series just below the suture; canal narrow, long, only slightly recurved. Length, 1 in.

Sandwich Is.

Reeve's Iconica gives two figures of *C. graniferum*, of which the first (fig. 6) represents this species.

C. TURRITUM, Sowb. Pl. 28, figs. 55, 56.

Distantly ribbed, the ribs cut into tubercles by three spiral riblets, between which are spiral striæ, suture excavated.

Philippines; Japan.

The last-named locality is for *Pfeifferi*, Dunker (fig. 56), a synonym.

C. ATTENUATUM, Phil. Pl. 28, fig. 57.

Whitish, more or less suffused with chestnut, or entirely chestnut color; whorls rather flat, with alternate large granulated and small smooth spiral riblets; outer lip crenated, canal long, narrow, oblique. Length, 2 in.

Philippines.

It is *C. longicaudatum*, Ads. and Reeve.

C. MATUKENSE, Watson. Pl. 28, fig. 58.

With close, rounded longitudinal ribs, granulated by distant spiral threads, three or four on a whorl, occasionally varicose; whitish, with glossy brown spiral lines, and speckled with milk white. Length, 1·5 in.

Viti Is.

Allied to the preceding species in form, but differs in sculpture.

C. PHOXUM, Watson. Pl. 28, fig. 59.

With 10 or 11 longitudinal riblets, gradually becoming less regular, and four or five spiral striæ, tuberculating the riblets as they cross the latter, the wider spiral interspaces have each two or three inferior striæ; besides these, the whole surface is covered with finely fretted microscopic spirals; waxy straw color, stained with brownish flesh color. Length, 17 mill.

Viti Is.

C. NOBILIS, Reeve. Pl. 28, fig. 60.

Solid, smooth, flat, tumid at the suture, upper whorls angular, ribbed, tuberculated by spiral sculpture, lower whorls with spiral elevated lines; yellowish white, with fulvous, waved, longitudinal strigations. Length, 5 in.

Philippines.

C. BITUBERCULATUM, Sowb. Pl. 28, fig. 61.

Whitish, whorls with a pair of largely tuberculated spiral ribs beneath the suture, and a smaller granulated rib above it, finely striated. Length, 45 mill.

Australia.

C. ASPER, Linn. Pl. 28, figs. 62, 63.

With numerous, pinched-up, obliquely longitudinal ribs and equal interspaces, asperated at the crossing of spiral ribs, the interspaces of the latter often bearing several incised spiral lines; white, or yellowish white, the spiral riblets sometimes chestnut colored.

Singapore, Mauritius, Madagascar, Friendly Is., etc.

It is *C. vibex*, Gmel., *C. granulatum*, Linn, *C. rugatum*, Mart., *C. lineatum*, Lam. (fig. 63).

C. FASCIATUM, Brug. Pl. 28, fig. 64; Pl. 29, figs. 65–67.

Smooth, longitudinally plicate at the suture, more or less spirally incised, upper part of spire nodosely ribbed; whitish, spirally lined, or interruptedly spotted or blotched with chestnut color.

Length, 2·25–3·5 in.

Indian Ocean, Philippines.

It is *C. procerum*, Kiener, *C. Martinianum*, Pfr. (fig. 67).

C. PHAROS. Hinds. Pl. 29, fig. 68.

Closely longitudinally plicate at the suture, spirally distantly incised, upper whorls granularly ribbed; whitish, frequently spirally lineated with chestnut. Length, 2–2·25 in.

Paumotus, Viti Is., Indian Ocean.

Narrower and smaller than *C. fasciatum*, with finer and sharper sutural sculpture, but possibly only a variety of that species. It is *C. subulatum* (Lam.), of Kiener.

C. VERTAGUS, Linn. Pl. 29, figs. 69, 70.

Ventricose, smooth, longitudinally plaited at the suture, with distant faint spiral incised striæ, upper whorls asperate; yellowish white, sometimes more or less stained with, or entirely chestnut color. Length, 2–2·5 in.

East Indies, Philippines.

V. vulgaris, Schum., is a synonym.

Var. TÆNIATUM, Quoy. Fig. 70.

Smoother, the sutural plaits obsolete; yellowish white, chestnut banded.

New Guinea.

Subgenus CAMPANILE, Bayle, 1884.

C. LÆVE, Quoy. Pl. 29, fig. 71.

White, ventricose, spirally striated, slightly tuberculated at the suture, last whorl roundly angulated and somewhat inflated beneath, columella twisted. Length, 6 in.

Australia.

The largest living species of the family.

Genus FASTIGIELLA, Reeve, 1848.

F. CABINATA, Reeve. Pl. 29, fig. 72.

White, with three strong spiral keels on the spire whorls and ten on the body whorl, the interstices and suture excavated.

Length, 1·75 in.

Hab. unknown.

F. SQUAMULOSA, Pease. = *Coralliophila.*
F. POULSENII, Mörch. (Unfigured.) *Eleuthera, Bahamas.*

Genus BITTIUM (Leach), Gray, 1847.

B. GEMMATUM, Watson. Pl. 29, figs. 73, 75, 85.

Longitudinally ribbed, spirally ridged, developing two spiral rows of rather large tubercles on the centre of each whorl, thin, translucent white. Length, 8 mill.

Atlantic Coast of Spain, Portugal; 27–994 fms.

Sometimes the sculpture is so faint as greatly to alter the appearance of the shell.

Jeffreys changed the name to *Watsoni* (figs. 75, 85) on account of *C. gemmatum*, Hinds; but the latter is not a Bittium.

B. LACTEUM, Phil. Pl. 29, figs. 74, 76, 77.

Whorls flattened, with three spiral rows of tubercles on each, body whorl with three inferior rows of less tuberculate ribs; white. Length, 8 mill.

Mediterranean Sea, Canary Is.

The synonyms include *B. niveum*, Bivona, *B. elegans*, Petit, *B. Algerianum*, Sowb. The following are slight variations from the typical form: var. *lutea*, B. D. D. (fig. 76), uniformly yellowish; var. *tessellata*, B. D. D., tessellated with chestnut between the granulations; var. *quadriseriata*, B. D. D. (fig. 77), with four rows of granules instead of three on the lower whorls.

B. RETICULATUM, Da Costa. Pl. 29, figs. 78–83.

Whorls convex, with four spiral ribs, crossed by longitudinal plications and occasional varices, the intersections scabrous or nodulous, base of body whorl with spiral sculpture only; uniform chestnut color. Length, 13–15 mill.

Europe, Canary Islands.

The synonymy includes *B. scabrum*, Olivi, *B. lima*, Brug., *B. Latreillei*, Payr., *B. granulosum*, Risso, *B. mamillatum*, Risso, *B. angustum*, Desh., *B. ferrugineum*, Midd., *B. vulgatissima*, Clark, *B. afrum*, Sandri, *B. acuminatum*, Pennant, *B. Danicum*, Beck, *B. elongatum*, Sowb., *B. spina*, Tiberi, *B. baccatum*, Costa, *B. granulatum*, Costa.

Bucquoy, Dautz. et Dollf. (Moll. Roussillon) enumerate the following varieties; which are however, scarcely entitled to varietal rank:

Var. SCABRA, Olivi.

Dark brown, granulations rounded, regular, theee series on a whorl (= var. *rudis*, Bragnone).

Var. LATREILLEI, Payr. Fig. 80.

Sculpture finer, light brown, the granulations dark brown, varicose.

Var. *variegata*, Monts., is a synonym.

Var. PALUDOSA, B. D. D. Fig. 81.

Whorls convex, longitudinal sculpture more prominent. Brackish water. *B. melanosa*, Monts., probably belongs here.

Var. JADERTANUM, Brusina. Fig. 82.

Smaller, more lanceolate, whorls a little more convex.

Var. *minor*, Phil. = this form.

Var. EXIGUA, Monts. Fig. 83.

Much elongated, whorls subcarinated in the middle, aperture very small.

Var. BIFASCIATUM, B. D. D.

Spiral sculpture scarcely visible, appearing as though only longitudinally costate, light yellowish, with two chestnut bands.

Probably var. *Sueziensis*, Issel, from the Red Sea, does not differ materially.

Var. LACTESCENS, Jeffreys.

Uniform whitish. = *B. albina*, Monts.

B. AMBLYTERUM, Watson. Pl. 30, figs. 93, 95, 99.

With close, rounded longitudinal ribs terminating in a spiral row of tubercles at the top and another at the bottom of each whorl, base of body-whorl smooth, translucent white. Length, 6·5 mill.

Bay of Biscay to *N. W. Africa*, 681 to 1261 fms.; *Azores*, 450 fms.; *Pernambuco, Brazil*, 675 fms.

Watson thinks it probable that *Cerithiella Whiteavesii*, Verrill, will turn out to be the same species; *B. gracile*, Jeffreys (fig. 95), is a synonym; *B. mamillanum*, Watson (fig. 99), described from a single specimen, afterwards broken, from Pernambuco, is apparently another.

B. ABRUPTUM, Watson. Pl. 30, fig. 97.

Longitudinal ribs about a dozen, low and narrow, divided by flat broader furrows, crossed by four spiral threads, forming prominent tubercles, base of body whorl smooth; translucent white.

Length, 6 mill.

Fayal, Azores; 450–500 fms.

B. ENODE, Watson. Pl. 30, fig. 1.

Finely longitudinally ribbed, terminating in a spiral subnodulous thread at the suture, a little below this a raised spiral line forms a slight carina, a less distinct one forms the inferior termination of the ribs, base of body whorl concave, smooth ; ivory white.

Length, 5 mill.

Off Pernambuco, Brazil; 675 fms.

B. VARIUM, Pfeiffer. Pl. 29, fig. 86.

Thin, diaphanous, greyish brown, unicolored or with chocolate cingulæ, longitudinally plicate, decussated by spiral striæ, the plications obsolete on lower part of the body-whorl—which is varicosely gibbous. Length, 5 mill.

West Indies.

It is *B. reticulatum*, Muhlf., and *B. gibberulum*, Ads.

B. PALLIDUM, Pfr. Pl. 29, fig. 87.

Somewhat solid, whitish or light corneous; whorls 9, slightly convex, longitudinally plicate and spirally minutely striate, the last varicose. Length, 6 mill.

Cuba, St. Thomas, W. I.

Larger and more robust than the preceding species, *B. columellare*, d'Orb., is a synonym.

B. NIGRUM, Totten. Pl. 29, figs. 88, 89.

Chocolate color, and conical-elongated when young, becoming lighter colored and less conical when adult, tuberculated by decussating sculpture, of which the spiral only persists on lower part of body-whorl. Length, 5 mill.

New England to Florida.

The synonyms are *B. reticulatum*, Totten, and *B. Sayi* (Menke), of Gould, etc.

B. iota, C. B. Ad. (fig. 89), is probably only the juvenile of this species.

B. FILOSUM, Gould. Pl. 29, fig. 90.

Whorls 8, planulate, each with four incised spiral lines, usually becoming obsolete on lower part of body whorl, suture excavated ; corneous, varying to chocolate color, sometimes light colored with the incised lines chocolate, interior chestnut color. Length, 15 mill.

Sitka to Monterey, Cal.

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B. ESURIENS, Carp. Pl. 30, fig, 16.

Like the preceding, of which according to Carpenter it is possibly a degraded variety, but much smaller. Length, 6·5 mill.

Vancouver's Isl. to San Pedro, Cal.

B. QUADRIFILATUM, Carp. Pl. 29, fig. 91.

Whorls slightly convex, with well-impressed suture, narrow, with close longitudinal ribs, crossed by four raised spiral threads, base of body whorl smooth, light ash color varying to chocolate, interior chestnut color. Length, 8 mill.

S. Pedro—S. Diego, Cal.

B. ASPERUM, Gabb. Pl. 30, fig. 7.

A stouter species than *B. quadrifilatum*, the whorls slopingly convex, forming an obtuse angle above the suture, sculpture similar, but stronger. Length, 10 mill.

Southern California.

Described as a fossil of the pleistocene of the same region, but has since been discovered recent. *B. rugatum*, Carp., is a synonym.

B. ATTENUATUM, Carp. Pl. 30, fig. 8.

With about 10 rather narrow, rounded whorls, with scarcely impressed suture, with longitudinal riblets, distinct only at the top of the whorls, where they are decussated by two spiral lines, the spiral sculpture also becoming fainter below, base of body whorl prolonged, with about six spiral striæ. Length, 10 mill.

California.

B. PERUVIANUM, d'Orb. Pl. 30, fig. 21.

Ventricose, whorls slightly convex, granulated by longitudinal rounded ribs and spiral striæ, chestnut color. Length, 7 mill.

Near Arica, Peru.

B. PIGRUM, Watson. Pl. 30, figs. 4, 2, 3, 11.

With about 21 flatly rounded longitudinal ribs, and subequal interspaces, with three fine spiral threads, forming rounded tubercles on the ribs, suture defined above by a raised thread, which terminates the sculpture on the body whorl, being smoother on the base; dead white. Length, 9·5 mill.

Tristan da Cunha Is.

I think *B. luscinæ* (fig. 2), *B. philomelæ* (fig. 3), and *B. œdonicum*, Watson (fig. 11), are merely young shells of the species; they are all from the same locality.

B. DELICATUM, Watson. Pl. 30, fig. 6.

With about seventeen longitudinal ribs, separated by equal grooves, abruptly terminating about half-way on the rounded body whorl, spiral sculpture minute and faint, most prominent near the suture; translucent, glossy white. Length, 3·3 mill.

Tristan da Cunha Is.

B. GEORGIANUM, Pfeiffer. Pl. 29, fig. 92.

Whorls with three strong spiral cingulæ completely dominating the distant longitudinal costulations; rather thin; yellowish white with a few minute irregular fulvous spots, under a light yellowish epidermis. Length, 5 mill.

South Georgia Isl.

B, TRICARINATUM, Pease. Pl. 30, fig. 9.

Whorls turreted, rounded, with three strong spiral keels, longitudinally plaited, suture well impressed, light yellowish brown. Length, 7·5 mill.

Sandwich Is.

B. TURRITELLIFORMIS, Angas. Pl. 30, fig. 13.

Rather thin, finely spirally ridged, interstices very minutely longitudinally striated; whorls 10, the last keeled below, with smooth, somewhat concave base; light yellowish brown, inclining to reddish purple on the upper whorls. Length, 8 mill.

Port Jackson, Australia.

B. PERPUSILLUM, Tryon. Pl. 30, fig. 17.

Brownish, whorls 9–10, with four spiral rows of granules, longitudinally subplicate, base with five additional spiral riblets, suture deep. Length, 6 mill.

Japan.

Described by Dunker as *B. pusillum*, preoccupied by Gould.

B. ALUTACEUM, Gould. Pl. 30, fig. 10.

Whorls strongly longitudinally ribbed, crossed by three spiral ridges, forming three series of large tubercles, interstices deeply pitted, suture deep; brownish, the ridges of the last whorl spotted with chestnut. Length, 6 mill.

China Sea.

B. LAWLEYANUM, Crosse. Pl. 30, figs. 5, 94, 96.

Whorls flatly convex, rounded at the suture, spirally distantly grooved, bluish, white banded. Length, 10 mill.

So. Australia, N. Zealand.

Closely allied to *B. filosum*, Gould, of the West Coast of North America; it is also very nearly related to the next species. *B. insculptum*, Sowb. (fig. 94), is a synonym, and *B. arctum*, Hombr. et Jacq. (fig. 96), described from a single poor specimen, is probably identical; if so its name should have precedence.

B. PLUMBEUM, Sowb. Pl. 30, fig. 23.

Scarcely longitudinally costate, spirally striate, whorls 10, somewhat convex, brownish or plum color. Length, 13 mill.

Australia.

B. LACERTINUM, Gould. Pl. 30, fig. 100.

Whorls crenulated at the edge, with four spiral tuberculated ribs, two upper ribs approximate, the others more distant, with an interstitial line, brownish. Length, 13 mill.

Sydney, N. S. Wales.

This has been considered a synonym of the next species, but I think its relationship rather remote.

B. GRANARIUM, Kiener. Pl. 30, fig. 98.

Longitudinally costulate, crossed and cut into numerous beads by spiral sculpture, base of body whorl smooth or spirally striate, reddish brown or chocolate color, sometimes the beads are chestnut colored on a light ground. Length, 22 mill.

So. Australia, Tasmania.

B. GLAREOSUM, Gould. Pl. 30, fig. 19.

Longitudinally plicate, crossed by four spiral rows of beads, suture excavated, blackish brown. Length, 5 mill.

Loochoo and *Bonin Islands.*

B. PARCUM, Gould. Pl. 30, fig. 20.

Longitudinally roundly plaited, spirally ribbed, ribs tuberculated on the plaits; whorls few, slightly ventricose, the last rather fusiform; yellowish white. Length, 3 mill.

Loochoo Is.

B. PUSILLUM, Gould. Pl. 31, fig. 25.

Longitudinally about 10 ribbed, crossed by four lines on each whorl, forming granules, spiral sculpture more numerous on the last whorl, extending to the base; whorls 8, convex; fulvous.

Length, 5 mill.

Sandwich Is.

B. ALTUM, Sowerby. Pl. 31, fig. 26.

Pale fawn color, with white varices, spirally banded with chestnut, minutely decussated by spiral and longitudinal lines.

Length, 23 mill.

Hab. unknown.

B. OOSIMENSE, Watson. Pl. 30, fig. 12.

Whorls flatly sloping, with about 13 oblique longitudinal ribs, and narrower interstices, the ribs terminating on the spire whorls in a spiral tuberculated angle, just above the suture, on the body whorl becoming gradually evanescent below the angle, spirally striate throughout; brownish grey, suffused with ruddy brown, with white spots where the spiral sculpture crosses the ribs.

Length, 5 mill.

Oosima, Japan.

B. AMBOYNENSE, Watson. Pl. 30, fig. 15.

Whorls with about 20 rounded ribs and narrower interstices, crossed and divided into rounded tubercles by three or four spiral furrows, a smaller spiral thread just above the suture and on the middle of the body whorl, below this, on the latter, the sculpture is continued, but fainter; pale yellowish brown. Length, 3·5 mill.

Amboyna.

B. DIPLAX, Watson. Pl. 30, fig. 14.

With 10–15 small, narrow riblets, with much wider interspaces, crossed on each whorl by two spiral riblets, forming nodules at the intersections, and causing each whorl to have a sloping angle above and below, and a concave flat area between the spirals, base of body whorl with three or four additional, non-tuberculated riblets; white or sandy, with a chestnut tinge towards the apex. Length, 25 mill.

Amboyna.

B. CYLINDRICUM, Watson. Pl. 30, fig. 18.

With about twenty-five longitudinal riblets separated by subequal interspaces, and crossed by three threads, which expand into depressed, rounded tubercles, below the middle of the body whorl the surface is smooth, the pillar defined by a minute spiral thread.

Length, 6·5 mill.

Sydney, N. S. Wales.

B. PUPIFORME, Watson. Pl. 30, fig. 22.

With about twenty-five proximate tuberculated ribs, and three spiral threads on each whorl, and a strong sutural furrow; shell solid; translucent, glossy white. Length, 2·5 mill.

Cape York, Australia.

B. FURVUM, Watson. Pl. 31, fig, 27.

Clathrate by 12–15 narrow ribs, and three narrow spiral riblets, the intersections nodulous, the wide interspaces with decussating microscopic striæ, whorls slightly shouldered, body whorl with several spiral ridges below the middle; dark chestnut colored.

Length, 2·7 mill.

Sydney, N. S. Wales.

B. XANTHUM, Watson. Pl. 30, fig. 24.

Less shouldered and not quite so stout as the preceding species, with about 18 ribs, base longer and more attenuated, no microscopic striæ; shell thin, ochraceous. Length, 3·5 mill.

Torres Strait, N. E. Australia.

B. PERPARVULUM, Watson. Pl. 31, fig. 29.

Shell only about half the size of *B. furvum*, but so close to it in form and sculpture that I suspect that it will prove a minor form of that species. The small differences are comparative only and can be seen by inspecting the respective figures. Yellowish, or pale chestnut, becoming nearly white below, sometimes chestnut or white throughout. Length, 1·5 mill.

N. E. Australia to Sandwich Is.

B. LEUCOCEPHALUM, Watson. Pl. 31, fig. 30.

About 12, rounded ribs, with wider interspaces, crossed by three narrow spiral ridges, the intersections nodulous, whorls a little shouldered as in the preceding species, but not so high, base and aperture also shorter; yellowish or whitish. Length, 2·5 mill.

Off Honolulu, Sandwich Is.

Very like the preceding, with wider, fewer ribs and shorter base.

B. PORCELLANUM, Watson. Pl. 31, fig. 28.

Whorls slopingly shouldered above and below, the wide, flattened middle space only bearing distant narrow longitudinal ribs, base of body whorl with three spiral ridges, porcellanous white and glossy, apex yellowish chestnut with a whitish tip.

Length, 3·75 mill.

Cape York, N. E. Australia.

Section CERITHIDIUM, Monts., 1884.

B. SUBMAMILLATUM, Rayneval. Pl.. 29, fig. 84.

Whorls 12, convex, with deep suture, with eight longitudinal ribs and much wider interspaces, crossed by five revolving riblets,

(eight on the body whorl), forming obscure nodules; yellowish or brownish. Length, 5 mill.

Cape Breton; Mediterranean and Black Seas.

It is *? C. Schwärtzii*, Hornes, a fossil form, and *C. pusillum*, Jeffreys. The last-named would have priority, but Gould used the name for another species six years earlier. Monterosato has enumerated vars. *albina*, *ecostata* and *baliolina*, but without description.

Unfigured Species of Bittium.

B. ORYZA, B. CINEREOFLAVA and var. CROCEA, B. ALABASTRULUM and B. GALACTIS, Mörch. *St. Thomas, W. I.*

B. YUCATECANUM, Dall. *Yucatan Strait.*

B. RUGULOSUM, B. VICINUM, B. BICOLOR, B. GEMMULOSUM, B. LATUM, B. EXILE, all of C. B. Adams. *Jamaica.*

B. ARMILLATUM, B. FASTIGIATUM, Carp. *California.*

B. NITENS, Carp. *C. St. Lucas, L. California.*

B. MINIMUM, B. TURBONILLOIDES, and B. SEMILÆVIS, Tenison-Woods. *Tasmania.*

B. EXILE, Hutton. *New Zealand.*

B. TEREBELLOIDES, Martens (*B. cinctum* and *B. Kirki*, Hutton). *New Zealand.*

B. CRATICULATUM, Gould. *Hongkong.*

B. SCALATUM, Dunker. *Japan.*

Genus POTAMIDES, Brong., 1810.

Subgenus PYRAZUS, Montfort, 1810.

P. EBENINUS, Brug. Pl. 31, fig. 31.

Longitudinally plicate, spirally ridged, angulated, nodose at the angle; dark chocolate color, spire usually lighter colored towards the apex, aperture pale fawn color. Length, 4 in.

Australia, N. Zealand.

P. PACIFICUS, Sowb. Pl. 31, fig. 32.

Chocolate colored or brownish, spirally striated, whorls with an acute spinose-nodose angle. Length, 1·5 in.

Panama to Valparaiso.

? C. Humboldti, Val., is a synonym.

P. LAMARCKII, Valenc. Pl. 31, fig. 33.

Fawn or light chocolate color, whorls shouldered, plicate, sloping to a peripheral double angle, with a double line of small tubercles. Length, 1·35 in.

Coast of Cumana, Venezuela.

Subgenus TYMPANOTONOS, Klein., 1753.

P. FUSCATUS, Linn. Pl. 31, fig. 34.

Solid, spinosely tuberculated in the middle of the whorls, with spiral rows of granules above and below the suture, body whorl with two rows of granules below the peripheral angle, base closely spirally ridged; epidermis thick, chocolate brown, aperture yellowish white. Length, 2·3 in.

Gambia, Cape Palmas, W. Africa.

P. muricatus, Brug., and *P. cingulatus*, Gmel., are synonyms.

P. RADULA, Linn. Pl. 31, figs. 35, 36.

Spirally ridged, and beaded by the crossing of longitudinal riblets, whorls concavely channeled below a sutural row of beads, base spirally ridged; epidermis dark chocolate color. Length, 1·75 in.

W. Africa.

Different as this appears from the preceding species, the specimens before me almost prove a transition from one into the other. *P. terebella*, Gmel., *P. granulatus*, Brug., *P. fluviatilis*, and *P. aculeatus*, Gmel., *P. Owenii*, Fer. (fig. 36), are synonyms.

P. HOMOLOGUM, Bayle. Pl. 31, fig. 37.

Narrower, more cylindrical than the preceding species, sculpture similar in pattern, but more minute; variegated chocolate and white. Length, 1·75 in.

W. Coast of Africa.

This is *P. multigranosus*, Sowb., preoccupied by Deshayes for a fossil species.

P. FLUVIATILIS, Potiez et Michaud. Pl. 31, figs. 38–40; Pl. 32, figs. 49, 51, 52.

Whorls flattened, with deeply incised suture, each with three flat-topped spiral ribs, tuberculated in longitudinal rows, tubercles obsolete on the back of the body whorl except a sutural row, base spirally ridged; aperture in the adult expanded, angularly produced above, oblique, outer lip produced below; yellowish white or glaucous, narrowly banded with chocolate, sometimes white-banded at the suture. Length, 2 in.

India, Singapore, Borneo, China, Japan, Philippines, Australia.

The type was a younger shell in which the aperture had not yet expanded; Kiener described the adult as *P. micropterus* (fig. 39). Other synonyms are *P. alatus*, Phil. (fig. 49), *P. radix*, Dufo, *P. incisus*, Hombr. et Jacq. (fig. 51), and var. *minor*, Tapparone Canefri, *P. retifera*, A. Ad. (fig. 40), *P. euryptera*, A. Ad. (fig. 52), a pupoidal-shaped variation, from the Philippines.

P. PALUSTRIS, Linn. Pl. 32, figs. 41, 42.

Whorls flat, with deep suture, divided by three spiral incised lines, upper whorls longitudinally plicate, gradually becoming indistinct below; epidermis and interior dark chocolate, the latter sometimes banded. Length, 4–5 in.

India, Java, Australia.

The synonyms are *P. agnatus*, Gmel., and *P. crassus*, Lam.

P. CALEDONICUS, Jousseaume. Pl. 32, figs. 43, 44.

Like *P. palustris* in sculpture, but the longitudinal ribs much more distinct, form narrower, more cylindrical; yellowish white, more or less banded and blotched with chocolate. Length, 2·5 in.

New Caledonia.

Subgenus TEREBRALIA, Swains., 1840.

P. SEMITRISULCATUS (Bolten), Mörch. Pl. 32, fig. 45.

Upper whorls flat, plaited, all of them with incised revolving lines —of which there are about five on the penultimate whorl; glaucous, more or less broadly banded and variegated with chocolate.

Length, 2·5–3 in.

Australia, Java.

P. SULCATUS, Born. Pl. 32, figs. 46, 47.

Whorls longitudinally strongly ribbed, tuberculated by the crossing of incised spiral sulcations, chocolate brown or glaucous, banded with chocolate, aperture often banded. Length, 1·5–2·25 in.

Singapore, China, Philippines.

The synonyms are *P. Molluccanus*, and *P. fuscus*, Gmel., and *P. Mangiorum*, Schrœter.

P. GOURMYI, Crosse. Pl. 32, fig. 48.

Smooth, finely, closely, spirally striated; epidermis yellowish brown, reticulately longitudinally strigate, or interruptedly blotched with chestnut, interior white. Length, 2·5 in.

N. Caledonia; Bampton Reef, So. Pacific O.

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Subgenus TELESCOPIUM, Montf., 1810.

P. TELESCOPIUM, Linn. Pl. 33, fig. 56.

Whorls with about three spiral sulci, dividing broader, flat-topped ridges, base strongly ridged, varying to nearly smooth, channeled around the spirally twisted columella; chocolate brown of varying shades, sometimes obscurely banded. Length, 3–4 in.

India, Singapore, Borneo, Philippines, etc.

P. fuscum, Schum., and *P. indicator*, Montf., are other names for this species.

Subgenus CERITHIDEA, Swainson, 1840.

C. MONTAGNEI, d'Orbigny. Pl. 33, figs. 57, 58; Pl. 32, fig. 50.

Chestnut or chocolate color, with a narrow, medium white band, often with darker bands, interior banded with chocolate and light yellowish brown, base of body whorl defined by a slight ridge. Length, 1·5–1·75 in.

Panama to Lower California; Cerros Is.

It is *C. Reevianum*, C. B. Ad., and *C. Largillierti*, Phil.

Var. PULCHRA, C. B. Ad. Fig. 50.

Whorls varicose, the sculpture stronger, often becoming subnodose.

Gulf of California to Panama; ? Chili.

The synonymy includes *C. varicosa*, Sowb. (preocc. = *C. fortisculum*, Bayle, fig. 58), *C. Hegwischii*, Phil. and *C. valida*, C. B Ad.

C. OBTUSA, Lam. Pl. 33, figs. 59–61, 63; Pl. 32, fig. 53.

Ventricose, sinuously longitudinally ribbed, spirally grooved, rendering the ribs nodulous; chestnut color, light banded below the suture, and again below the periphery of the body whorl; apex decollated. Length, 2 in.

Malacca, Singapore, Philippines.

Var. KIENERI, Hombr. et Jacq. Figs. 61, 53.

Narrower, ribs more distant, apex not decollated.

Var. QUADRATA, Sowb. Fig. 63.

Whorls white-banded in the middle instead of at the suture.

C. DECOLLATA, Linn. Pl. 32, fig. 54.

Chestnut or chocolate color, usually more or less banded in different shades, with frequently a white band at the suture, closely longitudinally ribbed and spirally striate, the striæ appearing mostly in the interstices of the ribs, apex decollated. Length, 1·33 in.

India, Timor, Madagascar, etc.

Turbo pulcher, Dillw., is a synonym.

C. RHIZOPORARUM, A. Ad. Pl. 33, figs. 67, 62.

More robust and cylindrical than last species, with whorls not so convex, with numerous rounded ribs cut into nodules by spiral ridges, light yellowish brown, with chestnut lines, or a central pair of them, or sometimes a single peripheral band; apex decollated.

Length, 1·33 in.

Borneo and *Philippines*, on Mangroves.

C. Quoyi, Hombr. et Jacq. (fig. 62), is a synonym.

C. CORNEA, A. Ad. Pl. 32, fig. 55.

Thin, obscure brown, rather distantly, smoothly, obliquely ribbed, finely spirally striated, base of last whorl spirally striate, defined by a peripheral ridge; apex decollated. Length, 28 mill.

Borneo, mouths of rivers.

C. ORNATA, A. Ad. Pl. 33, fig. 64.

Chestnut color, white banded below the suture, and below the periphery of the last whorl, distantly, longitudinally, plicately ribbed, scarcely spirally striate except on the base; apex slightly decollated. Length. 1–1·5 in.

Philippines.

C. FORTUNEI, A. Ad. Pl. 33, figs. 65, 66.

Whorls well rounded, including the body whorl, sinuously longitudinally ribbed, spirally striate on the base; glaucous, banded with brown, or all brown; apex acute. Length, 1–1·5 in.

Shanghai, China.

C. SACRATA, Gould. Pl. 33, figs. 69–72.

Epidermis thin, glaucous, under which the shell is chocolate colored, often with a central narrow white band; longitudinally ribbed, and occasionally thickly varicose, crossed by spiral ridges, the crossings varying from nearly smooth to roughly tuberculate; apex usually entire. Length, 1·25 in.

Mazatlan to California.

C. Californica, Hald., is an earlier name for this species, but it has not obtained currency. *C. Mazatlanica*, Carp. (fig. 70), is a roughly sculptured, and *C. pullata*, Gould (fig. 71), an almost smooth form.

Var. ALBONODOSA, Carp. Fig. 72.

Shell smaller, with thick white varices. Length, 1 in.

C. RISSOIDEA, Sowb. Pl. 33, fig. 73.

With curved, longitudinal, oblique ribs, which are noduliferous beneath; whorls convex, base spirally ribbed; brown, the ribs whitish; Length, 19 mill.

Port Natal, So. Africa.

C. MÖRCHI, A. Ad. Pl. 33, fig. 68.

Rather thin, glaucous, more or less spirally lined with red; longitudinally rather faintly ribbed, closely spirally ridged; apex decollated. Length, 1 in.

Philippines.

C. TURRITELLA, Quoy. Pl. 34, figs. 93, 94.

Chestnut colored or lighter, often with a white band, granulated in three or four spiral rows by decussating sculpture, lower part of body whorl with revolving riblets only. Length, 1 in.

Australia.

Almost exactly like *C. conica*, Blainv., of the Mediterranean Sea, as to form and sculpture; the base is longer and more rounded, and it has not the iufrasutural white band of that species.

C, BICARINATA, Gray. Pl. 35, figs. 15, 16.

Obscurely, distantly, longitudinally, narrowly plicate, spirally striate, base defined by a double ridge; chocolate color, white at the suture, interior brownish. Length, 1 in.

New Zealand.

C. lutulentum, Kiener, is a synonym.

Var. SUBCARINATA, Sowb. Fig. 16.

Base with three ridges.

C. Australis, Gray (not Lam.), and *C. nigra*, Hombr. et Jacq., are considered synonyms by Hutton.

C. SCALARIFORMIS, Say. Pl. 33, figs. 78, 75, 76.

Whorls slopingly convex, the well impressed suture usually defined by a narrow thread, with numerous, close longitudinal riblets, and less distinct spiral sculpture, base of body whorl with spiral riblets only; whitish, glaucous; light fawn color to chocolate, the lighter colored specimens often with chocolate, the darker ones with whitish lines; aperture like the exterior. Length, 1 in.

Florida.

C. tenuis, Pfr. (fig. 76), is very probably a young shell of this species.

C. IOSTOMA, Pfr. Pl. 34, fig. 79.

Shell strongly longitudinally ribbed and varicose, spirally striate, striæ stronger on the base; chocolate color, with a narrow central white band. Length, 22 mill.

So. Carolina—West Indies, Belize.

Narrower and much more rugose than the preceding species. Reeve's figure is not characteristic. This is probably *C. Lafondi*, Mich., and *C. Hanleyi*, Sowb. (fig. 74), a white variety of it. Many of the figures in d'Orbigny's "Cuba" are so poorly drawn that their recognition is somewhat difficult, yet I think *C. Lavalleana*, d'Orb. (fig. 77), may be referred here, rather than to *C. scalariformis*.

C. COSTATA, Da Costa. Pl. 34, figs. 80–82.

Shell narrowly elongated, with numerous rounded longitudinal ribs, more or less beaded by several spiral riblets, suture well-impressed; chestnut or chocolate color, sometimes white-banded. Length, 15 mill.

West Indies.

C. ambigua, C.B. Ad. (fig. 81), is a vatiety in which the spiral sculpture is more strongly developed, making the surface roughly nodulous; other synonyms are *C. salmacida*, Morelet (fig. 82), and *C. Petitii*, Schramm.

C. TURRITA, Stearns. Pl. 34, fig. 83.

Rather thin, purplish white to chocolate, often with an inconspicuous central white line; whorls convex, with thin, numerous whitish longitudinal ribs, ending below the periphery in a spiral thread, no other spiral sculpture, suture deeply grooved.

Florida.

Section APHANISTYLUS, Fischer, 1884.

C. CHARBONIERI, Petit. Pl. 34, fig. 96.

Thin, corneous brown, smooth, with distant rude, low, longitudinal plications; whorls rather flat, with a spiral thread at the suture, forming a carina on the body whorl, base spirally striated. Length, 1·75 in.

Borneo.

C. unicarinata, Metcalfe, is believed to be identical; it was the first published, but has not been illustrated.

C. SINENSIS, Phil. Pl. 34, figs. 97, 98.

Thin, light corneous, smooth, with low rounded ribs and subequal interspaces, body whorl obtusely angulated at the periphery, base smooth; sometimes a faint chestnut line below the periphery. Length, 1·2 in.

China; Annam.

I think that *C. Moreleti*, Wattebl. (fig. 98), will prove to be a minor form of this species, or perhaps with shell not fully developed; a faint double carina encircles the base. It is from the last-named locality.

Unfigured Species.

C. MINOR, Mörch (*C. minuta*, Dkr. MSS.). *Cuba.*

C. PUPOIDEA, Mörch. *West Indies.*

C. PLICULOSA, Menke. *West Indies.*

C. SIMILIS, C. RARICOSTATA, C. CRASSILABRUM, C. BALTEATA, C. ALBIVARICOSA, all of A. Adams. *Philippines.*

C. ALTERNATA and C. TRICARINATA, Hutton. *New Zealand.*

Subgenus PIRENELLA, Gray, 1847.

P. LAYARDI, A. Ad. Pl. 34, figs. 86, 87, 84.

Glaucous to chocolate color, usually light banded at the suture, whorls with three series of nodules caused by decussating sculpture, on the body-whorl the spiral sculpture becomes more prominent, the ribs fading out. Length, 15 mill.

Ceylon; Cape York, N. Australia.

C. Bombayana, Sowb. (fig. 84), appears to be a more than usually smooth state of this species.

P. CONICA, Blainv. Pl. 34, figs. 88–92, 85.

Glaucous, chestnut or chocolate color, white banded at the suture, and sometimes on the periphery, with three rows of beads on the upper whorls and four rows on the body whorl, formed by decussating sculpture, base with a few spiral ridges. Length, 1 in.

Mediterranean Sea, Red Sea.

The principal synonyms are *C. mamillata*, Phil. (figs. 88–90), and *C. Sardoum*, Cantraine (fig. 92). Monterosato has enumerated color-varieties, *albida*, *fasciata*, *atra* and *fusca*. *C. Cailliaudi*, Pot. et Mich., from the Red Sea, does not appear to differ, except in the nodules being somewhat more prominent; the same may be said of *C. cinerascente*, Pallas (fig. 85), Isle of Karak, Persian Gulf.

P. CLATHRATA, A. Ad. Pl. 27, fig. 18.

White, turreted, whorls 9, ventricose, spirally two-ribbed, crossed by numerous longitudinal plaits forming beads at the intersections, last whorl angular beneath, with a double rib at the angle.

Length, 13 mill.

Ins. Bohol, Philippines.

Described by A. Adams as *Cerithium clathratum*, and changed by Bayle to *C. sinon*, on account of *C. clathratum*, Desh., a fossil species of the Paris basin; the original name can stand under the present classification.

Subgenus LAMPANIA, Gray.

L. AUSTRALIS, Quoy. Pl. 34, figs. 99, 100.

Rather distantly longitudinally plicate, forming a nodulous slight shoulder on the whorls, with spiral beaded riblets and intermediate thread-like striæ; chocolate and glaucous, often white banded at the suture; interior whitish, with chocolate sulcations.

Length, 1·6 in.

Australia.

L. UNDULATUM, Sowb. Pl. 34, fig. 2.

Whorls with rounded, nodulous shoulder, and beaded spiral riblets; light yellowish brown, black-spotted between the shoulder-nodules. Length, 22 mill.

This name being preoccupied in Cerithium for a fossil species, Bayle changed it to *C. rivale.*

L. SUBVIRIDE, Sowb. Pl. 35, fig. 18.

Whorls rather flat, a little tuberculate at the suture, spirally sulcate; yellowish brown, with an interrupted band of chocolate at the suture. Length, 22 mill.

Hab. unknown.

This and the preceding will probably prove identical.

L. DIEMENENSE, Quoy. Pl. 34, fig. 1.

Yellowish olive color, chocolate colored beneath the epidermis, with strong longitudinal plications, and spiral striæ, whorls without shoulder. Length, 18 mill.

Tasmania.

L. CUMINGII, Crosse. Pl. 34, fig. 7.

Short, rather inflated on the lower part of the whorls, spirally sulcated, varicose; yellowish, with a broad chocolate band.

Length, 1 in.

Japan.

L. Steenstrupi, Troschel, is a synonym.

Var. CONCOLOR, Schrenck.

Entirely chocolate color, or obscurely tessellated.

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L. ZONALE, Brug. Pl. 34, figs. 3, 4; Pl. 35, fig. 14.

Obscurely longitudinally plaited, forming slight tubercles on the shoulder of the whorls, spirally sulcated; chocolate brown, white banded on the shoulder. Length, 1·5 in.

Hongkong (Stimpson); *Japan* (Lischke).

It is *L. pyrenale*, Quoy.

Var. ATERRIMA, Dunker. Fig. 14.

Shell unicolored, dark chocolate.

Japan.

L. ATRAMENTARIA, A. Ad. Pl. 34, fig. 5.

Whorls somewhat inflated below, spirally sulcate; dark chocolate or obscurely tessellated; white at the suture; columella arched, white. Length, 1·5 in.

Hab. unknown.

L. MULTIFORMIS, Lischke. Pl. 35, fig. 13; Pl. 34, figs. 6, 8.

Short, club-shaped, spirally striate, sometimes with longitudinal ribs, stronger at the suture; chocolate color, or tessellated or banded with white. Length, 1 in.

Japan.

L. Cumingii of Reeve's Iconica (not Crosse).

L. ANGULIFERA, Sowb. Pl. 35, fig. 17.

Whorls flat, angulated on the body-whorl, longitudinally plaited, cut into tubercles by three spiral grooves; brownish or olivaceous-black; aperture grooved. Length, 1 in.

Australia.

Section LAMPANELLA, Mörch, 1876.

L. MINIMUS, Gmelin. Pl. 34, figs, 9–11.

Longitudinally obscurely ribbed, ribs fading towards the middle of the body whorl, spirally ridged, ridges beaded, more nodose above; black (epidermis olivaceous), often with a white sutural band, or white with a central black band, or chestnut or chocolate colored or white or yellowish brown, sometimes white with chocolate lines, interior chocolate brown. Length, 15 mill.

So. Carolina to West Indies; Bermuda.

I have endeavored vainly to separate into several species, as Mörch has done, this very variable form; the coloring patterns have not sufficient constancy for even varietal distinction. The synonyms are:

L. septemstriata, Say, usually applied to specimens with white sutural band, *L. nigrescens*, Menke, for the uniformly dark colored specimens, *L. nigrinum*, Phil., being identical, *L. clathrata*, Menke, *L. heteroclytes*, Lam., *L. striatella*, Dillw., *L. albovittata*, C. B. Ad., *L. Peloritana*, Cantraine, *L. laevigata*, Phil. (= *desolata*, Bayle), probably a worn specimen. *Cerithium Brongniarti*, Marav. (*C. Piraini*, Benoit, and *C. Hymerensis*, Calcara, are said to be synonyms), has been referred here by some European authors; others have considered it a distinct species allied to *C. vulgatum;* its identification remains doubtful.

L. CORNEUM, Kiener. Pl. 35, fig. 19.

Thin, translucent, with rounded whorls and narrow longitudinal plications, spirally striate; reddish brown. Length, 10 mill.

Hab. unknown.

I know nothing about this species; it seems to have escaped subsequent monographers. It is scarcely a member of the present group.

Genus CERITHIOPSIS, Forbes and Hanley, 1853.

C. TUBERCULARIS, Montg. Pl. 35, figs. 20, 22–25, 27.

Apicial whorls smooth, the apex somewhat styliform; normal whorls with three spiral rows of regular, rounded tubercles, periphery of last whorl angular, marked by a thread, base flattened, a little concave; chocolate brown. Length, 6·5 mill.

Europe, Madeira, W. Africa, W. Coast of N. America.

The synonymy includes *C. pulchella*, Jeffreys (fig. 23), *C. Henkelinsii*, Nyst, *C. Clarkii*, Hanley (fig. 25).

Var. ACICULA, Brusina.

Form very narrow, elongated.

C. nana, *C. Barleei* (fig. 27), and *C. acicula*, Jeffreys, are synonyms.

Var. ALBA, Jeffreys.

Shell white.

Var. OBESULA, B. D. D.

Shell smaller, form pupoidal.

Var. BILINEATA, Hœrnes. Fig. 24.

Shell with two rows of tubercles on each whorl.

C. Barleei, Tiberi, *C. ventricosa*, Brusina, *C. Coppolæ*, Aradas, are synonyms.

Var. TUBERCULATA, Carp.

Appears to differ from the European examples only in being more robust.

Vancouver's Isl. to Southern Coast of California.

I have tried in vain to find characters of sufficient importance to distinguish this from the type specifically.

Var. TUBERCULOIDES, Carp. Fig. 22.

Smaller than European examples with the tubercles farther apart. Length, 3·75 mill.

Southern California to Mazatlan.

Var. ALBONODOSA, Carp.

Like the preceding, reddish brown, with whitish tubercles, the 4 nuclear whorls subcarinated.

Mazatlan.

C. MINIMUS, Brusina. Pl. 35, fig. 26.

Pupoidal, embryonal whorls smooth, white, the others dark brown, with three rows of granulations, base convex, spirally striate.

Length, 3 mill.

Europe, Madeira.

Distinguished from the preceding species by its smooth, white embryonal whorls, its smaller size, and rounded striated base. *C. neglecta*, Weink., is a synonym.

C. ATALAYA, Watson. Pl. 35, fig. 28.

Apical whorls 4, longitudinally finely ribbed, cut across by two spiral threads near the bottom of each whorl; normal whorls as in *C. tubercularis*, body whorl with a circumbasal thread, within which the base is radiatingly striated. Length, 6 mill.

Madeira.

Jeffreys considers this a variety of *C. tubercularis*.

C. DIADEMA, Watson. Pl. 35, figs. 30–32.

Apex spirally striate, other apical whorls finely obliquely longitudinally ribbed, becoming keeled below, and finally nodulous; normal whorls as in *C. tubercularis*, base smooth encircled by two ridges, of which the outer one is nodulous. Length, 6·5 mill.

Mediterranean; Madeira.

C. fibula, Jeffreys, and *C. tiara* (fig. 30) and *C. Fayalensis*, Watson (fig. 32), are probable synonyms. Monterosato has referred to a *C. corona*, Watson, and named a variety *scalaris;* I find no description of this species and think it probable that *C. diadema* was intended.

C. HORRIDA, Jeffreys. Pl. 36, fig. 44.

Apex blunt, smooth, next whorl with a few longitudinal ribs, normal whorls as in *C. tuberculariis*, base concave, encircled by a slight ridge; color pale brownish yellow. Length, 9 mill.

Mediterranean; *Madeira.*

C. GEMMULIFERUM, E. A. Smith. Pl. 35, fig. 33.

Whorls 11, the first three smooth, the others with three rows of granules, the infrasutural series small; light brown.

Length, 4 mill.

Whydah, W. Africa.

C. GREENII, C. B. Ad. Pl. 35, fig. 36.

Swollen in the middle, with subulate spire, whorls brown with deep suture, and three rows of granules, base convex, with a few spiral striæ. Length, 4–5 mill.

Massachusetts to Florida.

Dr. Jeffreys considered this = *C. tuberculariis*, Mtg., but I think its relationship is closer to *C. minima*, Brusina. I am not prepared to pronounce upon their identity.

C. PUNCTATUM, Linn. Pl. 35, figs. 34, 35.

Whorls flat, longitudinally ribbed, ribs cut into three rows of granules by spiral sculpture, the upper and lower rows more prominent, the middle one often reduced to a mere line, minutely or scarcely granular, and nearer the upper than the lower row, suture deeply excavated, body whorl with the base concave, smooth, encircled by a pair of cord-like ridges; light or dark brown, usually darker brown in the suture. Length, 12 mill.

Massachusetts to Florida; West Indies.

This species is better known to American conchologists as *C. Emersonii*, C. B. Ad. (fig. 35), but was previously described from accidentally occurring European specimens as *C. subulatum*, Montagu, and *C. elegans*, Blainv. Philippi was the first to identify it with *C. punctatum*, Linn., the description of which suits it well.

C. FLAVUM, C. B. Ad. Pl. 35, fig. 37.

Bright yellowish brown, with three spiral carinæ, and about 26 less prominent longitudinal ridges, the intersections feebly nodulous, base bounded by an additional slightly nodulous ridge; whorls 9, slightly convex, thin, with distinct suture, base flattened; canal short, very wide. Length, 5 mill.

Jamaica and St. Thomas, W. I.

C. PULCHELLUM, C. B. Ad. Pl. 35, fig. 38.

Subcylindrical-pupoidal, whorls with two spiral ridges of rather large nodules, of which the upper one is larger, and is doubled on the lower whorls, anteriorly with two additional ridges, of which the upper one is subnodulous; whorls about 11, the lower one a little contracted, terminating obtusely; white, with a brown band on the lower spiral row of tubercles. Length, 3·5 mill.

Jamaica, Guadeloupe, West Indies.

C. GUARANIANUM, d'Orb. Pl. 35, fig. 39.

Shell brown, with four spiral rows of somewhat oblique tubercles, base defined by a thread-like ridge. Length, 3 mill.

Rio Janeiro, Brazil.

C. STEJNEGERI, Dall. Pl. 35, figs. 40, 41.

Thin, purplish, with white nucleus and columella; nucleus smooth, partly immersed, normal whorls 6, strongly sculptured, rather rounded, sculpture consisting of three spiral series of tubercles, separated by rather deep channels, anterior channel bordered by the raised, convex, smooth base. Length, 5·5 mill.

Alaska.

Var. TRUNCATUM, Dall. Fig. 41.

Nuclear whorls large, of a soft, almost fleshy consistency, breaking off in drying.

This is probably a pathological condition of the species, as surmised by Dr. Dall.

C. COLUMNA, Carp. Pl. 35, fig. 21.

Purplish brown, with 9 normal, flat whorls, and distinct suture, having a clathrate pattern of nodules formed by the crossing of longitudinal ribs by three spiral ribs, base rounded, spirally ridged. Length, 8·5 mill.

Vancouver's Isl. to Southern Coast of California.

"Easily recognized, even in portions, by the 'strung-fig' pattern."

C. PURPUREA, Carp. Pl. 35, fig. 43.

Upper half of whorls brown, or brownish purple, lower half white or lighter brown, body whorl brown, with a white peripheral band; with three spiral series of nodules, base rounded, with spiral liræ. Length, 7·5 mill.

California.

C. MUNITA, Carp. Pl. 35, fig. 42.

Like *C. purpurea*, but narrower, with almost straight margins, spiral costæ stronger, nodules less expressed, base equally lirulate. Length, 8 mill.

Vancouver's Island.

C. CONVEXA, Sowb. Pl. 36, fig. 54.

Whorls 10, convex, with deep suture, elegantly cancellated, the intersections subnodose, the interstices quadrate, revolving ribs four on each whorl, peripheral carina not tuberculated, base concave, smoothish. Length, 4·5 mill.

Mazatlan.

C. GRACILLIMA, Sowb. Pl. 36, fig. 45.

Dark brown, longitudinally lightly plicate; spirally tuberculate; whorls oblique, rather ventricose, suture slightly excavated. Length, 9 mill.

Hab. unknown.

I know not whether it is by accident or design that Sowerby's figure represents a reversed shell.

C. DESTRUGESI, Folin. Pl. 36, fig. 46.

Yellowish, brown banded above and below the suture; whorls 14, with four spiral series of beads on each, caused by crossing of longitudinal and spiral riblets, the two middle series smaller, base defined by a ridge, and bearing several liræ. Length, 6 mill.

Bay of Panama.

C. CÆLATUM, Couthouy. Pl. 36, fig. 47.

Light chestnut color, with thirteen scarcely convex whorls; longitudinally plicate and encircled by three rows of nodules, suture impressed, marked by a thread, which also appears on the periphery of the last whorl, base smooth. Length, 19 mill.

Terra del Fuego.

C. PULVIS, Issel. Pl. 36, fig. 48.

Cylindrically pupiform, attenuated towards the apex, which is mucronate, fulvous chestnut; whorls 7–8, almost flat, slowly enlarging, at first smooth, afterwards granulate in three series, the upper row darker colored, base smooth, defined by a row of minute granules. Length, 2·25 mill.

Gulf of Suez.

C. ANGASI, Semper. Pl. 36, fig. 49.

Rather thin, pale yellowish brown; whorls 12, flattened, encircled by three somewhat distant rounded riblets, clathrate by close longi-

tudinal, somewhat undulating, raised striæ, suture deeply impressed, base of last whorl radiately striated. Length, 6 mill.

Port Jackson, Australia.

Described by Angas under the preoccupied name of *C. clathrata.*

C. GRACILIS, Sowb. Pl. 36, figs. 50, 51.

Very slender, white or brownish, reticulated by prominent, minutely beaded spiral ribs, crossed by longitudinal raised lines; whorls oblique, ventricose. Length, 18 mill.

Hab. unknown.

Sowerby's specific name being preoccupied in Cerithium, Bayle changed it to *C. amabile.*

C. SUBRETICULATA, Dunker. Pl. 36, fig. 57.

Shell brownish, whorls 11–12, with three spiral series of granules, of which the middle one is depressed, suture well impressed, base smooth, concave, defined by a thin thread. Length, 6 mill.

Japan.

C. BALTEATA, Watson. Pl. 35, fig. 29.

Whorls with a row of rounded tubercles just below the suture and short longitudinal ribs below them; yellowish white with a broad brown band. Length, 2 mill.

Fiji Is.

Section METAXIA, Monts., 1884.

C. METAXÆ, Chiaje. Pl. 36, figs. 52, 53.

Whorls narrow, convex, with three spiral series of transverse nodules on the upper and four on the lower whorls, the nodules are arranged to show longitudinal ribs; last whorl with carinated periphery, base smooth, flattened or concave; columella twisted, lip deeply cut out at the base; color varying from light yellowish brown to ferruginous red. Length, 8 mill.

Mediterranean.

The synonyms include *C. Crosseana,* Tiberi (fig. 53), *C. subcylindrica,* Brusina, and *C. rugulosum,* Sowb., with its vars. *fulva, flava* and *exilissima,* Mts.

C. ANGUSTISSIMA, Forbes. Pl. 36, fig. 55.

Whorls 16, strongly angulated in the middle, with deep suture, earlier whorls smooth, rounded, subsequent ones ribbed, divided by two nodulous spiral ribs above and two below the carina; yellowish, under a corneous epidermis. Length, 9 mill.

Palermo.

C. Benoitianum, Mts., is a synonym.

Section SEILA, A. Ad., 1861.

C. TEREBRALE, C. B. Ad. Pl. 36, figs. 56, 58.

Whorls 10, flattened, with three sharp, elevated spiral ridges on each, the intermediate channels showing microscopic longitudinal striæ, base short, smooth, bounded by a ridge; chocolate brown.

Length, 7·5 mill.

Massachusetts to West Indies.

The synonyms are *C. terebellum*, C. B. Ad., *C. interruptum* (Menke) Krebs, *C. trilineatum*, Phil. (fig. 58).

C. ASSIMILATA, C. B. Ad. Pl. 36, fig. 59.

Chocolate color, three revolving sharp ribs on the spire whorls, with additional ones on the periphery and base of the body whorl —the last minute; whorls 16–18, flattened, suture very indistinct.

Length, 6–10 mill.

Panama to Mazatlan.

C. CARINATA, E. A. Smith. Pl. 36, fig. 60.

Whorls 15, the first three smooth, convex, with three narrow spiral carinæ, the interstices longitudinally closely striated.

Length, 6 mill.

Whydah, W. Coast of Africa.

C. BACILLUM, Issel. Pl. 36, fig. 63.

Whorls 10–11, convex, with deep suture, whitish, with four spiral cords, and close longitudinal striæ in the interstices, base smooth.

Length, 3 mill.

Red Sea.

C. KANONI, Folin. Pl. 36, fig. 62.

Whitish, shining, maculated with longitudinal chestnut veins; whorls 11, flat, each with three rounded spiral ribs, between them widely longitudinally striated, base smooth, short, concave, defined by a slight ridge. Length, 5 mill.

Bay of Panama.

C. MORELETI, Folin. Pl. 36, fig. 61.

Chestnut brown, yellowish white towards the apex; whorls 11, flat with three revolving narrow ridges, the somewhat wider interspaces distantly longitudinally lirate, as though beaded, base smooth, defined by a thread. Length, 8 mill.

Bay of Panama.

C. DEXTROVERSA, Ads. and Reeve. Pl. 36, fig. 64.

Whorls about 18, spirally tricarinate, the middle carina much smaller, between them wider interspaces or channels, distinctly longitudinally striate; whitish. Length, 12·5 mill.

China Sea.

C. CEREA, Sowb. Pl. 36, fig. 65.

Whitish, with three spiral ribs, and narrower intermediate sulci. Length, 16 mill.

Australia.

C. CROCEA, Angas. Pl. 36, figs. 66, 67.

Rather thin, orange colored, deeper tinted in the channels; whorls 14, each with four rounded, close-set spiral ribs, the very narrow interstices longitudinally striated, base flattened and smooth, nuclear whorl sinistral. Length, 10 mill.

Port Jackson, Australia; Viti Is.

Var. PURPUREA, Angas. Fig. 67.

Purplish brown, the ribs usually lighter tinted, a little more cylindrical, with a narrower base, and smaller than the type. Length, 7 mill. Tenison-Woods has described, but not figured, a variety *Atkinsoni*.

Section LOVENELLA, O. Sars., 1878.

C. METULA, Lovén. Pl. 36, fig. 68.

Solid, opaque, glossy, yellowish white; whorls 18–20 with two or three thread-like spiral ridges (four or five on the last whorl) and slight microscopic intermediate striæ and growth lines, the ridges are crossed by numerous curved, fine ribs, producing nodules or small tubercles at the points of intersection, base and apical whorls smoothish, the apex bulbous and obliquely twisted; canal distinct, narrow, twisted. Length, 20 mill.

Norway to Bay of Biscay, Villafranca.

C. nitidum, McAndrew and Forbes, is a synonym.

C. OBELISCOIDES, Jeffreys. Pl. 36, fig. 69.

Rather thin, semitransparent, glossy, white; whorls 7–9, convex, with deep suture defined by a spiral thread, with numerous fine longitudinal striæ, and several thin spiral threads on the middle of the whorls. Length, 4 mill.

Atlantic O. (Porcupine Exped.).

C. CYLINDRATUM. Jeffreys. Pl. 36, fig. 70.

Thick, opaque, lustreless, pale yellowish brown; whorls 10–12, rounded, but compressed, with numerous straight longitudinal,

crossed by three spiral riblets, the intersections minutely beaded, body whorl with four spiral striæ, besides a line below the periphery.

Length, 5 mill.

Mediterranean, Atlantic.

C. PROCERUM, Jeffreys. Pl. 36, fig. 71.

Solid, opaque, pale yellowish white, glossy; whorls 13–14, somewhat convex, with curved, oblique longitudinal ribs, about 30 on the last and 20 on the penultimate whorl, three uppermost whorls nearly smooth, base marked with flexuous striæ, in continuation of the ribs, periphery of last whorl with a spiral ridge.

Length, 10 mill.

Between Scotland and Faroë Is.

C. Danielseni, Friele, is a synonym.

C. BIZONALIS, Jeffreys. Pl. 36, fig. 72.

This is a fragment obtained by the Porcupine Expedition in the North Atlantic O. It shows longitudinal distant riblets crossed by two distant spiral riblets on each whorl.

C. WHITEAVESII, Verrill. Pl. 36, fig. 73.

Whorls angular, with longitudinal riblets, forming tubercles on the angle, and an inferior row of tubercles just below the suture; the body whorl has a spiral thread below the angle, with a smooth base.

Length, 4 mill.

Off Martha's Vineyard, Mass. (365–500 fms.); *Gulf of St. Lawrence* (200 fms.).

C. costulata, Whiteaves (not Möller), is a synonym.

Section EUMETA, Mörch, 1868.

C. COSTULATA, Möller. Pl. 36, fig. 74.

Shell solid, semitransparent, glossy, white, with sharp, prominent longitudinal ribs, cut off at the periphery by a spiral ridge; ribs traversed and indented by two or three thread-like impressed lines or striæ, besides slighter, finer intermediate striæ in the interstices of the ribs and on the base. Length, 10 mill.

Northern Europe—Arctic America—New England.

It is *Bittium arcticum*, Mörch, and *C. Naiadis*, Woodward.

Unfigured Species of Cerithiopsis.

C. HANLEYANA, C. CONTIGUA, Monts. *Mediterranean.*

C. CINGULATA, A. Ad. *Japan.*

C, INTERCALARIS (*Guacomayo*), C. FORTIOR (*Sta. Barbara, Cal.*), of Carpenter.

C. CEREA, C. SOREX, C. DECUSSATA, C. PUPIFORMIS, Carpenter. *Mazatlan.*

C. NEGLECTA, C. BIMARGINATA, C. B. Adams. *Panama.*

C. FUSIFORME, C. B. Ad. (*C. neglecta*, Sowb., not Adams, may be the same). *Jamaica.*

C. CRYSTALLINA, C. SIGSBEANA, Dall. *West Indies.*

C. JOHNSTONI, Petterd. *Tasmania.*

C. ALBOSUTURA, Tenison-Woods. *Tasmania.*

C. SCABRELLA, Tapparone-Canefri. *Papuan Is.*

C. PAXILLUS, C. ROSEA, C. PAGODULUS, C. CERINA, C. BACULUM, C. CLAVULA, of A. Adams. *Japan.*

C. AURANTIACA, C. LAQUEATA, C. RUGOSA, C. SEMIPICTA, of Gould. *China Sea.*

Subgenus LÆOCOCHLIS, Dunker and Metzger, 1874.

L, GRANOSA, S. Wood. Pl. 36, fig. 75.

Shell reversed, whorls well-rounded, closely spirally ridged, lower part of body whorl smooth, occasionally longitudinal sculpture is developed; white. Length, 40 mill.

Arctic Europe.

First described as a pliocene fossil. It is *L. Pommeraniæ*, Dunker and Metzger, *Triforis MacAndreæ*, A. Ad., and *T. nivea*, M. Sars, MSS.

Genus TRIFORIS, Desh., 1824.

T. REGALIS, Jouss. Pl. 37, fig. 76.

Solid, white, or rarely maculated with chestnut, truncate, persistent whorls about 12, longitudinally costate, cut by closer spiral sculpture, suture scarcely impressed, thread-margined.

Length, 8–11 mill.

New Caledonia.

Very closely allied to the next species.

T. NODIFERUS, Ad. and Reeve. Pl. 37, fig. 77.

Whorls 12–14, turreted, subangulated in the middle, nodose in three spiral series, nodules strongest on the angle; white.

Length, 7 mill.

China Sea.

T. TIBIALIS, Jouss. Pl. 37, fig. 78.

Solid, white, with interrupted chestnut lines, costate, granulated by the crossing of four spiral liræ; whorls 17, suture scarcely conspicuous; aperture chestnut and white, maculated. Length, 13 mill.

Tahiti.

T. GIGAS, Hinds. Pl. 37, fig. 79.

Long and narrow, whorls 25–28, planulate, granular in four spiral series, the lower one the strongest, base granularly punctate. Length, 1 in.

New Guinea.

T. ACUTUS, Kiener. Pl. 37, fig. 85.

Shining, whitish, with numerous whorls, triseriately granular. Length, 10 mill.

Hab. unknown.

A doubtful species.

T. CONCORS, Hinds. Pl. 37, fig. 80.

Whorls 22, flattened, with three spiral series of nodules, the middle one smallest, suture lined. Length, 14 mill.

Straits of Malacca.

T. DOLICHA, Watson. Pl. 37, fig. 81.

Whorls 11, flat, with channeled suture, the ribs made nodulous by three spiral series of lines, base defined by a carina, two-threaded, canal short and broad; light brown, with dark stains. Length, 5 mill.

N. E. Australia.

T. SCULPTUS, Hinds. Pl. 37, figs. 82, 83.

Light brownish, with 15–18 concave whorls, nodosely carinate above and below, with a smaller carina in the middle. Length, 12 mill.

Straits of Malacca.

T. pyramidalis, Ad. and Reeve (fig. 83), from China Sea, appears to be identical.

T. REEVEI, Desh. Pl. 37, fig. 84.

Whitish, with a black tip; whorls 15, narrow, each bearing a row of granules above and below, the lower row smaller, concave between them. Length, 5 mill.

Isle of Bourbon.

Smaller than the preceding, without the centre carina, but very likely the same species, notwithstanding these differences.

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T. BILIX, Hinds. Pl. 37, fig. 86.

Outline a little convex on the sides, whorls 18, light colored, tricarinate, the lower carina larger, marbled, middle carina smallest.

Length, 7 mill.

Straits of Malacca.

T. MAXILLARIS, Hinds. Pl. 37, fig. 87.

Roseate or light chocolate color, whorls 16–18, smooth, bisulcate, the margins of the sulcations very minutely granular, as are those of the sulcate suture. Length, 13 mill.

Straits of Malacca.

T. MICANS, Hinds. Pl. 37, figs. 88, 89.

Brownish, with 20–22 whorls, each with three series of whitish granules, the lower series largest, the upper one smallest.

Length, 14 mill.

New Guinea.

I think that *T. alveolatus*, Ad. and Reeve (fig. 89), from China Sea is synonymous.

T. VERRUCOSUS, Ad. and Reeve. Pl. 37, fig. 91.

Whorls 18–20, with three spiral series of transversely oblong, strong tubercles; whitish. Length, 8·5 mill.

China Sea.

T. HINDSI, Desh. Pl. 37, fig. 90.

Light brownish, sides slightly convex; whorls 12, with three subequal spiral series of whitish granules. Length, 6 mill.

Isle of Bourbon.

T. FORMOSUS, Desh. Pl. 37, fig. 92.

Light violaceous, sides a little convex; whorls 15, flattened, with channeled suture, each bearing a spiral row of whitish granulations above and below. Length, 6 mill.

Isle of Bourbon.

T. ANGASI, Crosse. Pl. 37, fig. 93.

Rather thin, brownish; whorls 15, with three spiral series of quadrate, flattened tubercles, the body whorl with four series, the lower one bearing a white band; aperture lirate with brown within.

Length, 7 mill.

Gulf of St. Vincent, N. Australia; N. Zealand.

Cerithium minimum, Hutton, is a synonym.

T. MARMORATUS, Pease. Pl. 37, fig. 94.

Whorls 15, slightly convex, with three spiral series of granules, the lower series largest; light brownish, the granules white.

Length, 10 mill.

Sandwich Is.

T. FUSCA, Dunker. Pl. 37, fig. 95.

Somewhat solid, brownish, sides a little convex; whorls 12–14, with distinct suture, with close, subconfluent granules in three spiral series, the middle narrower and fainter. Length, 10–11 mill.

Japan.

T. ISLEANUS, Velain. Pl. 37, fig. 96.

Shell yellowish, whorls 14 or 15, scarcely convex, with three spiral rows of granules, the upper one less developed.

Length, 9 mill.

Islands of St. Paul and Amsterdam, Ind. Ocean.

T. MALVACEUS, Jousseaume. Pl. 37, figs. 97, 97a.

Rather solid, violet-ash color, granules white; whorls 18, biseriately, spirally granulated, the granules margining the suture on either side. Length, 5–9 mill.

New Caledonia.

T. DOUVILLEI, Jouss. Pl. 37, fig. 98.

Solid, yellowish white; whorls 15, biseriately spirally granulated Length, 6 mill.

Mauritius.

T. BLAINVILLI, Jouss. Pl. 37, fig. 99.

Rather solid, light cinnamon brown; whorls 16–17, with three spiral series of tubercles, and well impressed suture, body whorl with two additional carinæ, not tuberculated. Length, 4·5 mill.

N. Caledonia.

T. MARIEI, Jouss. Pl. 37, fig. 100.

Rather solid, narrow, yellowish white; whorls 15, flat, with three spiral series of granules, the middle one smaller, the first whitish, the third yellowish, body whorl with two additional series.

Length, 6·5 mill.

N. Caledonia.

T. BIGEMMA, Watson. Pl. 37, fig. 1.

Solid, yellowish white, pale brownish at the base of each whorl and base of body whorl; whorls about 22, convex, with deep suture,

minutely margined above and below, with two spiral rows of tubercles, connected in each row by a spiral thread, and a much smaller row of granules next below the suture. Length, 15 mill.

West Indies, 390–640 fms.

T. cylindrellus, Dall. (unfigured), is referred here by Jousseaume, and *T. abruptus*, Dall. (unfigured), is said to be a variety.

T. HEBES, Watson. Pl. 37, fig. 2.

Solid, translucent white, whorls 12, with three spiral rows of strong tubercles, separated by spiral squared channels, margin of base defined by a thread. Length, 6 mill.

Tristan da Cunha Islands, So. Atlantic O.

T. INFLATA, Watson. Pl. 37, fig. 3.

Solid, opaque, glossy, white; whorls 13, the normal ones slightly convex, with two spiral rows of tubercles, separated by a narrow triangular furrow, below them is a wider furrow, extending to the suture, above the suture is defined by a narrow marginal line, which is undulated rather than tuberculated. Length, 5 mill.

West Indies, 390–640 fms.

T. ASPERA, Jeffreys. Pl. 38, fig. 5.

Rather solid, nearly opaque and glossy, pale yellowish, with a faint tinge of brown, apical whorls dark brown; whorls 21–22, with two spiral series of strong tubercles and a subsutural series of minute granules, base with two spiral lines, and defined by a strong peripheral ridge, suture slight. Length, 15 mill.

Bay of Biscay; Sciacca, Sicily; Gulf of Mexico.

More slender, with stronger tubercles and more abrupt base than *T. perversa.*

T. ASPERRIMUS, Hinds. Pl. 38, fig. 6.

Whorls 24–26, angulated in the middle, with two spiral series of tubercles, granularly carinate near the suture. Length, 13·5 mill.

New Guinea.

Distinguished by its very narrow form.

T. GEMMULATUS, Ads. and Reeve. Pl. 38, fig. 7.

Pyramidal, with abruptly plain base, pellucid white; whorls 12–15, with three distant series of granules, the central one narrow, almost obsolete, causing the whorls to be concave in the middle, suture defined by a marginal line. Length, 7 mill.

China Sea.

T. ANGUSTISSIMUS, Desh. Pl. 38, fig. 8.

Shining, whitish, marbled with chestnut; whorls 14, narrow, with two series of rounded tubercles, last whorl with a peripheral carina and several raised lines on the base. Length, 4 mill.

Isle of Bourbon.

T. PFEIFFERI, Crosse. Pl. 38, fig. 9.

Rather thin, subtranslucent, whitish, regularly maculated with chestnut, whorls 18, with three spiral rows of beads, the middle one minute, the lower largest, and bordered below by a thread—which is articulated with white and chestnut, base smooth.

Length, 8 mill.

Gulf of St. Vincent, N. Australia.

T. MIRIFICUS, Desh. Pl, 38, fig. 10.

Yellowish white, whorls 15, narrow, each with two rows of pellucid granules, and a wide concave interspace, on the body whorl four rows of granules, which are smaller. Length, 7 mill.

Isle of Bourbon.

T. DECORATUS, C. B. Adams. Pl. 37, fig. 4.

White, maculated with somewhat quadrangular large chestnut or chocolate spots, with three nearly equal spiral rows of beads and intermediate, narrow, deep channels, body whorl anteriorly with two additional smaller, more or less beaded spiral ridges; whorls 16, planulate, the suture deeply grooved. Length, 14 mill.

West Indies, Florida.

Section MASTONIA, Hinds, 1844.

T. VIOLACEUS, Quoy. Pl. 38, figs. 11, 12.

With convex sides and base, violaceus, whorls 20, suture slightly grooved, whorls with two rows of tubercles, which are rounded, rosy white. Length, 8–10 mill.

New Caledonia, New Ireland, Viti Is.

T. Ducosensis, Jouss. (fig. 12), was separated because it has only one canal-opening, whilst the true *violaceus* has a dorsal one remaining; a merely individual difference, as I have explained.

T. RUBER, Hinds. Pl. 38, figs. 13–16.

Pink, with the two rows of granules on each whorl, which are often yellowish, suture marked by a raised line. Length, 9 mill.

New Ireland, Tahiti, Isle of Bourbon.

T. roseus, Hinds (fig, 14), appears to differ only in the interposition of a minute additional series of tubercles; a condition fore-

shadowed, according to Hinds, in some of the specimens of the typical *ruber*. *T. distinctus* (fig. 15) and *T. Adamsi* (fig. 16), of Deshayes, from the Isle of Bourbon, may be considered identical with *T. roseus*.

T. VULPINUS, Hinds. Pl. 38, fig. 17.

Whorls 14, with three nodulous spiral carinæ, blackish, the lower carina white. Length, 6·5 mill.

New Ireland.

T. MONILIFER, Hinds. Pl. 38, fig. 18.

Whorls 10, biseriately spirally granular, the upper series white, the lower one articulated in the intervals with chestnut or chocolate. Length, 6 mill.

Straits of Malacca.

T. GRANULATUS, Ads. and Reeve. Pl. 38, fig. 19.

Whorls 12–14, yellowish white, with three crowded spiral series of nodules—five series on the body-whorl. Length, 6 mill.

China Sea.

T. SUTURALIS, Ads. and Reeve. Pl. 38, fig. 20.

Whorls 12–13, pellucid white, with three spiral series of granules, suture channeled, smooth, body whorl with an additional smaller series of granules and smooth base. Length, 6 mill.

China Sea.

T. SPECIOSUS, Ads. and Reeve. Pl. 38, fig. 24.

Whorls 18–20, biseriately nodose, the upper series much the largest; whitish, with an orange-red line below the upper series of nodules. Length, 8 mill.

China Sea.

T. ACICULA, Issel. Pl. 38, fig. 25.

Whorls 14, with two series of small granules and a wide, shallow interspace on each whorl, suture deeply channeled. Length, 3·5 mill.

Red Sea.

T. CLEMENS, Hinds. Pl. 38, fig. 21.

Whorls 15, triseriately granose, the middle series minute, the lower one large; yellowish corneous, the granules paler. Length, 6·5 mill.

Straits of Malacca.

T. CARTERETENSIS, Hinds. Pl. 38. fig. 22.

Whorls 14, triseriately granular, sulcate between the series, middle series small; yellowish white. Length, 6·4 mill.

Port Carteret, New Ireland.

T. CRENULATUS, Desh. Pl. 38, fig. 29.

Whorls 14, triseriately ridged, the lower ridge granular; yellowish white, with oblong, subquadrangular chestnut stripes.

Length, 9 mill.

Isle of Bourbon.

This is said to be a doubtful synonym of *T. æmulans*, Hinds (unfigured).

T. TASMANICA, Tenison Woods. Pl. 38, fig. 31.

Whorls about 12, yellowish, triseriately granular, the lower row chestnut-spotted between the granules, suture deeply channeled, body whorl with several ridges, without tubercles, on the base.

Length, 6 mill.

Tasmania.

T. CONCINNUS, Hinds. Pl. 38, fig. 23.

Whorls 11, triseriately granular, middle series small; yellowish brown, the lower series of granules black or brown, body whorl with five series of granules and two bands. Length, 6 mill.

Pacific Ocean (Hinds).

A specimen in the collection of the Academy at Philadelphia is labelled "Honduras".

T. PUPÆFORMIS, Desh. Pl. 38, fig. 26.

Whorls 12, suture scarcely distinctly channeled, biseriately granose, the granules lighter colored on a purplish ground, base bisulcate. Length, 4 mill.

Isle of Bourbon.

T. ATOMUS, Issel. Pl. 38, figs. 33, 32.

Similar to the above in form, ornamentation and color, but with three rows of basal granules, instead of the two sulci; whorls 6.

Length, 1·5–2·5 mill.

Red Sea, Mauritius.

Very likely this will prove synonymous with *T. pupæformis*. The last locality is for *T. crassula*, Martens (fig. 32).

T. OBESULA, Jouss. Pl. 38, fig. 27.

Whorls 13, brownish; becoming yellowish at the tip and base, with three series of spiral nodules, of which the middle one is minute, the body whorl with five series of nodules. Length, 4 mill.

New Caledonia.

T. PERLATUS, Issel. Pl. 38, figs. 28, 34.

Shining, whitish, whorls 12–13, with two spiral series of equal nodules, body whorl with three additional smaller anterior series of nodules. Length, 4–5 mill.

Red Sea.

Narrower than *T. atomus*, but similarly ornamented. *T. Servaini*, Jouss. (fig. 34), has a general coloring of dark yellow, but seen through a glass it has a yellow band and a white one on each whorl, the latter with dark spots between the nodules; it comes from the Red Sea also, and will, I think, prove to be a better colored specimen of the above.

T. CHAPERI, Jouss. Pl. 38, fig. 35.

Solid, white, yellowish brown at the base, whorls 12–14, biseriately tuberculated, last whorl with three series, suture linear.

Length, 4 mill.

Isle of Bourbon.

T. XYSTICA, Jouss. Pl. 38, fig. 36.

Shell chocolate color, the tubercles whitish; whorls 14–15, flattened, with channeled suture, and three spiral series of tubercles, last whorl with five series. Length, 13 mill.

Madagascar.

T. ROSSITERI, Jouss. Pl. 39, fig. 39.

Whorls 14, flattened, with channeled suture, reddish yellow, with four spiral series of sharp whitish granules, eight series on the body whorl. Length, 5–6 mill.

New Caledonia.

T. ÆGLE, Jouss. Pl. 39, fig. 40.

Yellowish ash color, tubercles paler; whorls 15, biseriately tuberculate, last whorl with three additional, smaller, anterior series.

Length, 5 mill.

New Caledonia.

T. CNODAX, Jouss. Pl. 39, fig. 47.

Rather solid, yellowish, with the tubercles red; whorls 15, subdistantly biseriately sharply tuberculated, the body whorl with three series. Length, 6 mill.

N. Caledonia.

T. FUNEBRIS, Jouss. Pl. 39, fig. 48.

Solid, whorls 15, each with a band of black, followed by one of white, biseriately tuberculate, body whorl with four series, of which three are black, the lower one being white. Length, 4–6 mill.

New Caledonia.

T. LIMOSA, Jouss. Pl. 39, fig. 38.

Rather solid, blackish-brown; whorls 16–17, biseriately tuberculate, the wider interspace with a median line, suture scarcely distinct, last whorl with six series of ridges, of which the three anterior ones are unarmed, Length, 8 mill.

N. Caledonia.

T. LEVUKENSE, Watson. Pl. 39, fig. 37.

Solid, yellowish white, with an interrupted amber-colored thread near the base of each whorl, glossy; whorls 17, suture sharply impressed, margined above by a minute flat surface, triseriately tuberculated, with two additional anterior smaller series on the body whorl. Length, 5·5 mill.

Viti Is.

T. RUFULA, Watson. Pl. 39, fig. 41.

With five apical and eight normal whorls, yellow, more or less ruddy, clathrate by distant rounded longitudinal and three spiral riblets, the intersections nodose, suture deeply channeled, body whorl with several ridges below the tubercles. Length, 7·5 mill.

Off Wednesday Island, Cape York, N. E. Australia.

T. CINGULIFERUS, Pease. Pl. 39, fig. 43.

Whorls 10, biseriately granular, with sometimes a minute series between the two on the later whorls; yellowish, the lower series chestnut colored, the base with additional alternate yellow and chestnut granular ridges. Length, 6 mill.

Sandwich Is.

T. TRICOLOR, Jouss. Pl. 39, fig. 49.

Solid, whorls 14–15, pale yellowish with two sutural bands, one white, the other black, triseriately tuberculate, last whorl with five series, suture deeply channeled, Length, 6 mill.

N. Caledonia.

T. ALTERNATUS, C. B. Adams. Pl. 39, fig. 50.

White, with a brown band below the suture, whorls 17, with inconspicuous suture, triseriately tuberculated, with two additional non-tuberculated ribs on the last whorl. Length, 7·5 mill.

Panama.

T. cucullatus, Folin, is a synonym.

T. TRISTOMA, Blainv. Pl. 39, fig. 42.

Whorls 15, triseriately tuberculated, the upper row strongest, suture whitish, channeled, with a minute row of granules; yellowish-chestnut, with a row of darker spots between the granules of the lower series. Length, 12 mill.

Australia.

The species was based upon its "three-mouths," and can no longer be identified with certainty.

T. EXILIS, Dunker. Pl. 39, fig. 45.

Whorls 10–11, triseriately granose, suture narrow, not deep, brownish, with a lighter line. Length, 5 mill.

Japan.

T. PERVERSUS, Linn. Pl. 39, figs. 44, 51.

Whorls about 16–18, flat, clathrate, with three series of rovolving and numerous longitudinal riblets, the intersections nodulose, body whorl with four spiral series, below which are two spiral ribs; yellowish brown, or chestnut color. Length, 15–30 mill.

Europe, Canary Is.

The synonyms are *T. Maroccanus*, Brug., *T. radula*, Olivi, *T. reticulatus*, Donov., *T. granulosus*, Scacchi, *T. tubercularis*, Blainv., *T. seriatus*, Muhlf., *T. inversus*, Costa, *T. Savignyanus*, Chiaje, to which European authors often add *Cerithium pusillum*, Pfr.

Var. BENOITIANUM, Aradas.

Established on a single individual 34·5 mill. long, with four series of granules on the spire and five on the body whorl, lip much dilated.

Ognina.

Var. ADVERSA, Montg. Fig. 51.

Shell smaller, 15 mill. long. This = var. *minor*, Monts., and *T. Belli*. Wood. It is found also on the California coast—at least no differences have been detected between these and European examples.

There are also vars. *cylindrata*, *obesula* and *attenuata*, Monts., founded upon the form of the shell, and the following color-varieties.

Var. BICOLOR, Mts. Brown, with white tubercles.

Var. CINCTA, Mts. Brown, with a white median zone.

Var. PALLESCENS, Jeffreys. Light fawn color.

Var. LACTEA, Mts. White.

T. NIGROCINCTUS, C. B. Ad. Pl. 39, fig. 52.

Dark chocolate color; whorls about 13–15, with three series of subequal granules, suture excavated, bearing a thread, body whorl with four series of tubercles, and two or three basal ridges below them. Length, 10 mill.

New England to West Indies.

Generally considered by European conchologists a variety of *T. perversus*, Linn., and perhaps should be relegated to that species. Dark specimens are unicolored, but lighter ones show the sutural thread darker—whence the name. *T. modestum*, Ads., appears to be the same, and Mörch refers here *Cerithium pusillum*, Pfr.

T. TURRIS-THOMÆ, Chemn. Pl. 39, fig. 53.

Whorls 11, each with a spiral series of large white tubercles, and a much smaller chestnut colored series, forming a band.

Length, 5 mill.

West Indies.

T. mirabilis, Ads., is a synonym.

T. INTERMEDIUS, C. B. Adams. Pl. 39, fig. 54.

Whorls about 12, at first with two, afterwards with three spiral series of tubercles, and three additional less nodulous ridges at the base of the body whorl; reddish brown, with a white spiral band on the lower part of the whorls. Length, 6–8 mill.

West Indies.

This is *T. turris-Thomæ*, d'Orb., not Chem.

T. ORNATUS, Desh. Pl. 39, fig. 46.

Triseriately tuberculate, dark brown, with here and there a white tubercle, and the lower series white banded. Length, 7–10 mill.

West Indies.

This and the two preceding species, though nearly related, appear to be distinct; the present is the most robust of the three.

Section SYCHAR, Hinds, 1844.

T. VITREA, Hinds. Pl. 39, fig. 55.

Pellucid, yellowish white; whorls 15, smooth, rounded, with a strong median raised line and a smaller one below it.

Length, 10 mill.

Straits of Malacca.

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Section VIRIOLA, Jousseaume, 1884.

T. VITTATUS, Hinds. Pl. 39, fig. 57.

Smooth, corneous, with a central dark brown line; whorls 22–25, with two subequal spiral ridges and alternate sulci.

Length, 18 mill.

Straits of Malacca.

T. BAYANI, Jouss. Pl. 39, fig. 56.

Solid, reddish-purple, a little shining; whorls 23, with three spiral carinæ, the interstices clathrate, suture linear, thread-margined, last whorl 5-carinate, aperture white, brown-zoned.

Length, 17 mill.

New Caledonia.

Is very probably a synonym of the next species.

T. CORRUGATUS, Hinds. Pl. 39, fig. 59.

Corneous; whorls 17–20 tricarinate, the middle carina smaller, corrugated between them, suture with a thread-like margin.

Length, 15 mill.

New Guinea.

T. CONNATUM, Montr. Pl. 39, fig. 60.

Whorls exceeding twenty, with three or four cingulæ, the wider interstices longitudinally punctate; chocolate color.

Length, 13–15 mill.

New Caledonia.

T. DUNKERI, Jouss. Pl. 39, fig. 61.

Rather solid, brownish; whorls 14–16 with two strong and one thin revolving ribs, the interstices longitudinally costulate and spirally striate; base planate. Length, 9 mill.

Japan.

Described by Dunker as *T. cingulata*, preoccupied by A. Adams.

T. ELEGANS, Hinds. Pl. 39, fig. 62.

White, marbled with chestnut; whorls 16–18, quadricarinate, carinæ alternating in size, close, maculated with white and chestnut.

Length, 10 mill.

Straits of Malacca.

T. CANCELLATUS, Hinds. Pl. 39, fig. 64.

Whorls 15–18, yellowish brown, bicarinate, the carinæ maculated with white, cancellated between them and marked by alternate chestnut and white longitudinal lines; suture channeled.

Length, 10 mill.

Straits of Malacca.

T. HILARIS, Hinds. Pl. 39, fig. 63.

Whorls 14, tricarinate, the two lower carinæ subequal, whitish, the upper one a little larger, maculated with chestnut.

Length, 10 mill.

Pacific Ocean (Hinds).

T. INCISUS, Pease. Pl. 39, fig. 65.

Whorls encircled by three prominent, smooth, regular ribs, interstices deep, very finely longitudinally striated; irregularly spotted and marbled with various shades of yellowish white, brown and purple.

Sandwich Is., Isle of Bourbon.

The last named locality is for *T. triliratus*, Desh., which Pease considered a synonym.

T. DEXTROVERSUS, Ads. and Reeve. Pl. 39, fig. 58.

Shell dextral, whorls 17–18, concave in the middle, spirally tricarinate, the middle carina much smaller, the interstices minutely concentrically striated, yellowish white. Length, 12 mill.

China Sea.

Differs from all the other species in being dextral, and for that reason I have already included it in Cerithiopsis; as it has usually been considered a Triforis, I repeat the description here.

Unfigured and Doubtful Species.

T. VARIEGATUS, A. Ad. (= *T. Arthuri*, Jouss.) *St. John's, W. I.*

T. INFREQUENS, T. BIMARGINATUS, C. B. Ad. *Panama.*

T. LACTEA, T. IANTHINA, T. MARGARITACEA, T. GRANULIFERA, T. VENUSTULA, T. DISTINGUENDA, of Dunker. *Viti Is.*

T. HARPERI, Jouss. (*T. alternata*, Pease) *Sandwich Is.*

T. BICOLOR, Pease. *Sandwich Is.*

T. FASCIATUS, Tenison Woods. *Tasmania.*

T. NIGRO-FUSCUS, and T. LABIATUS, A. Ad. *Sydney, Australia.*

T. CONSPERSUS, A. Ad. *Japan.*

T. LUSORIUS, T. LINEOLATUS, T. MINUTISSIMUS, Tapparone-Canefri. *New Guinea.*

T. INTERFILATUS (*Hongkong*), T. CALCULIFERUS (*Loo Choo*), T. CLATHRATUS, and T. INTERCALARIS (*China Seas*), of Gould.

T. KAUAINUS, Jouss. (*T. gracilis*, Pease, preocc. by himself). *Sandwich Is.*

T. ORYZA, T. BRUNNEUS, T. MACULATUS, T. PUSTULOSUS, T. TUBERCULATUS, Pease. *Sandwich Is.*

T. GRANOSUS (*Tahiti*), T. CYLINDRICUS (*Ins. Apaiang*), T. ROBUSTUS (*Ins. Makaimo*), T. PUNCTATUS and T. COSTATUS (*Ins. Annaa*), of Pease.

T. TRITICEA, T. PALLIDUS, T. SULCOSUS, T. GRACILIS, T. PERFECTUS, T. FLAMMULATA, T. SIMILIS, T. MINIMUS, T. CLAVATA, all of Pease. *Sandwich Is.*

T. PEASEI, Jouss. (*T. affinis*, Pse., preocc.). *Sandwich Is.*

T. FESTIVUS, T. SCITULUS (*Port Lincoln, Australia*), T. PULCHELLUS (*Hab. unknown*), T. VESTALIS and T. ALBIDUS (*Honduras*), T. CINGULATUS (*Red Sea*), all of A. Adams.

T. IBEX, T. COLON, T. INTERMEDIUS, T. TRISERIALIS, T. LONGISSIMUS, T. TORTICULUS, T. HIRCUS, all of Dall. *West Indies.*

T. NANA, T. PUSIOLA, T. SCHMELTZIANA, T. QUADRILINEATA, T. PENUTICULATA, T. VENTROSULA, all of Dunker. *Upolu*, etc.

T. EXIGUUS, T. NANUS, T. DEALBATUS, T. MELANURA, of C. B. Adams. *Jamaica.*

T. MARMORATUS and T. AFFINIS (*West Indies*), T. GRAYI (*Mediterranean*), T. COLLARIS and T. PAGODUS (*Philippines*), T. ÆMULANS and T. CŒLEBS (*Pacific Ocean*), T. CASTUS, T. CANDIDUS, T. TRISTIS and T. METCALFEI (*Hab. unknown*), all of Hinds.

T. EXILE and T. DEFORME, Eichw. These are generally referred to *C. ferrugineum*, Brug., but the figures represent them sinistral, like Triforis.

INDEX AND SYNONYMY.

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Family *LITTORINIDÆ.*

Animal (Pl. 40, fig. 74.) Proboscis wide and short; tentacles long, cylindrical, with eyes on small swellings at their outer bases; foot anteriorily truncate. Penis well developed, behind the right tentacle; reproduction oviparous or ovoviviparous. Radula long and narrow, 2·1·1·1·2 (Pl. 40, fig. 66.)

Shell spiral, turbinate or globular, not nacreous; aperture oval-rounded, entire, lip simple, columella thickened, flattened. Operculum (Pl. 40, fig. 75) corneous, paucispiral. The Littorinidæ have been monographed by Reeve, in Conchologia Iconica, vol. x, and by Küster and Weinkauff, in the Conchylien Cabinet.

Synopsis of Genera.

Genus LITTORINA, Fér. 1821.

Shell imperforate, turbinate, usually thick; aperture rounded, outer lip acute, columella rather flattened.

Foot obtuse behind, longitudinally divided, so that in walking each side advances alternately. The species inhabit the sea, brackish, or sometimes even fresh water, and are mostly littoral, feeding on algæ. Some of the species are the food of man in Europe, and they are also extensively gathered for bait. The lingual ribbon of the periwinkle is two or three times the length of the body of the animal; its canal passes from the back of the mouth under the œsophagus for a short distance, then turns up on the right side, and terminates in a coil resting on the plaited portion of the gullet; it contains about 600 rows of teeth.

The best-known species, *L. littorea*, is very abundant on the coasts of Northern Europe, and is also rapidly extending its area on our New England shores, where it appears to have been recently introduced. 1900 tons of this mollusk are sold annually in the London market, employing a thousand persons in gathering it. It is extensively distributed by English fishermen over the oyster beds, in order to keep them clear of sea-weed.

This and other large species are in a great measure amphibious, living on rocks and grasses where they are washed by the high tide: they will consequently withstand deprivation of water for a period; and several specimens of a West Indian species existed for over a year in my cabinet.

About 150 species have been generally admitted, inhabiting all parts of the globe. Fossil, they are rather numerous, commencing

with secondary forms: there are also some older fossils of somewhat problematical position, which may perhaps belong in the family.

Section LITTORINA (sensu stricto.)

Turbinate, thick, with moderate spire and acute apex. L. LITTOREA, Linn.

Section MELARAPHE, Muhlfeldt, 1828.

Shell rather thin, conical, with pointed spire; surface with revolving sculpture, and usually variegated with brilliant colors. Tropical and subtropical. L. SCABRA, Linn.

Littorinopsis (Beck), Mörch. 1876, is a synonym.

Section NERITOIDES, Brown, 1827.

Shell short, turbinate or subglobose, spire very short, with obtuse apex; solid, inner lip much thickened and excavated. L. OBTUSATA, Linn.

Neritrema, Recluz, is a synonym.

Section LAMELLILITORINA, Tryon.

Whorls crossed by lamellæ, like Scalaria. L. ALBICANS, Metcalfe.

Section LÆVILITORINA, Pfeffer, 1886.

Chitinous, scarcely chalky, fragile, rimate; lip thin, sharp, the extremities united by a thin callus; epidermis smooth.

L. CALIGINOSA, Gld. *Antarctic Sea.*

Section PELLILITORINA, Pfeffer, 1886.

Thin, imperforate, brownish, with rounded hairy whorls, columellar callus weak, peristome thin, acute. L. SETOSA, Smith.

Antarctic Sea.

Section AQUILONARIA, Dall., 1886.

Paludiniform, thin, membranous, imperforate, smooth, under a rough shaggy epidermis. Operculum paucispiral, with a raised subspiral rib on the inner side.

Animal (Pl. 40, fig. 73) much like *Littorina*, with entire sole, tissues soft and gelatinous, with a profusion of tenacious mucus; no jaw; phytophagous; mantle-edge plain, no opercular appendages; oviparous. A. TURNERI, Dall.

Labrador, and Arctic Ocean, north of Bering's Strait.

?Genus PORTLOCKIA, de Koninck, 1881.

Turbiniform, imperforate; spire somewhat elevated; whorls convex, with fine spiral ribs, some becoming larger on the last whorl; mouth oval, lip and columella thin.

10 species. Devon. to Carb.; *Europe*. P. PARALLELA, Phil.

?Genus RHABDOPLEURA, de Koninck, 1881.

Conical, height and diameter about equal; whorls 4–5, slightly convex, rapidly enlarging, the last more than half the total length, spirally ribbed; aperture transversely rounded, the inner lip somewhat callous, curved, and thickened below. R. SOLIDA, de Kon. Carboniferous.

Genus CREMNOCONCHUS, Blanford, 1869.

Shell perforate, turbinately globose, spirally ribbed; aperture subovate, margin simple, columella scarcely callous. Operculum partly calcareous.

Animal small, with short, thick proboscis, and long tentacles, with eyes on swellings at their base, foot short and rounded at the extremities, mantle margin finely crenulated. Dentition similar to *Littorina*. Found in *India*, upon rocks wetted by fresh water. C. SYHADRENSIS, Blanf.

First described as *Cremnobates*, Blanford; preoccupied in ichthyology.

Genus TECTARIUS, Valenc., 1833.

Usually imperforate, turbinated or subconical, tubercular or muricate, periphery frequently angular or biangular; aperture striate within, columella callous, subdentate at the base. Operculum paucispiral, with a broad membranous border. The animal is like *Littorina:* radula seven times the length of the shell, according to Quoy. *Tropical.*

T. PAGODUS, Linn.

It is *Pagodus*, Gray, 1839, *Pagodella*, Swains, 1840. I am also compelled to unite with this group, as synonyms, *Nina*, Gray, 1850, and *Echinella*, Swainson, 1840; their characters being very variable, and shading into those of the type.

?Subgenus BRACHYTREMA, Morris and Lycett.

I have described this form in Cerithiidæ (see p. 113), but its resemblance to the present group is also very marked.

Genus PURPURINA, d'Orb, 1850.

Shell narrowly perforate, turbinate, ventricose, thick, whorls rounded, channeled at the suture, longitudinally ribbed, spirally striate; aperture oval, subchanneled in front, columella arcuated, lip simple. P. BELLONA, d'Orb. (Pl. 40, fig. 78.) Jurassic.

Genus MODULUS, Gray, 1840.

Narrowly umbilicated, top-shaped, solid, grooved or ribbed and tuberculate; columella grooved, ending below in a sharp tooth. Operculum multispiral. Animal with long, cylindrical tentacles, bearing eyes at about half their length, mantle margin fringed, foot truncate in front, attenuated behind. M. TECTUM, Gmel. There are about a half dozen species, living in warm seas. Dentition, Pl. 40, fig. 71.

Genus RISELLA, Gray, 1840.

Shell trochiform, with flat whorls, angular periphery and concave base, imperforate; aperture rhomboidal, lip simple, usually brown-margined within. Operculum paucispiral.

Eyes on short peduncles at the base of the tentacles. Dentition, Pl. 40, fig. 67. R. MELANOSTOMA, Gmel.

Australasia.

Subgenus PEASIELLA, Nevill, 1884.

Shell umbilicated or perforate. Operculum concentric, multispiral. R. TANTILLA, Gould.

Polynesian, Indian.

Subgenus PLESIOTROCHUS, Fischer, 1878.

Imperforate, elongately conic, whorls numerous; aperture subrhomboidal, smooth within, prolonged into a short canal below, lip subrostrate in the middle. R. SOUVERBIANA, Fischer.

New Caledonia.

Subgenus LIMNOTROCHUS, E. A. Smith, 1880.

Umbilicated, conic, spirally ridged, aperture smooth within, the outer lip oblique, basal margin broadly sinuated, columella somewhat reflected, united to the lip above by a callosity. 2sp.

Lake Tanganyika, E. Africa (fresh water).

Scarcely separable from the preceding except by its different habit and locality. R. THOMSONI, E. A. Smith.

? Genus CYCLOCHEILA, Conrad.

Pyramidal; aperture circular; labrum expanded, columella flattened, subangular at the base; periphery angular.

A doubtful little tertiary shell from *South America;* probably fluviatile.

Genus LACUNA, Turton, 1827.

Shell turbinated or globular, thin, covered by an epidermis; aperture semilunar, columella flattened, with a parallel groove behind it ending in the umbilicus, lip sharp, arcuated. Operculum paucispiral (fig. 77.)

Animal (Pl. 40, fig. 76.) Proboscis short, tentacles long, thread-like, with eyes nearly sessile at their outer base, foot truncate in front, attenuated behind, operculigerous lobe with a long filament on either side. Dentition (Pl. 40, fig. 68.)

Spawn vermiform, thick, semicircular. Range low water to 50 fathoms. The Lacunæ feed upon sea weed, and the animal takes on the color of its food-plant.

Temana (Leach), Gray, 1847, is a synonym.

North Atlantic.

L. PALLIDULA, DaCosta. Fossil, tertiary; a single Triassic species.

Section LACUNA (sensu stricto.)

L. PUTEOLUS, Turton.

Section EPHERIA, Leach, *fide* Gray, 1847.

Shell thin, usually with spiral colored bands; spire rather elevated; inner lip thin, sharp, umbilical fissure linear. L. VINCTA, Turton.

Section MEDORIA, Leach, *fide*, Gray, 1842.

Conical, solid, with elevated spire, peritreme dilated, anteriorly reflected; inner lip thick, flattened, umbilical fissure obsolete. L. CRASSIOR, Mont.

Section HERSILIA, Monts, 1872.

The paper in which this group was published is inaccessible to me; I am therefore unable to give the diagnosis.

L. MEDITERRANEA, Monts. *Mediterranean.*

Section LACUNARIA, Conrad, 1866.

Ovate-conoidal or subglobose, thin, with delicate, close spiral lines; aperture entire, angulated posteriorly, margins disunited, columella flattened, with a long groove descending from the umbilicus. Eocene; *United States* and *France*. L. ALABAMENSIS, Whitfield (Struct. & Syst. Conch., t. 69, f. 34.)

Section HALOCONCHA, Dall, 1886.

Depressed, heliciform, few whorled, thin, with a strong epidermis, lip thin, with narrow reflexed margin in the adult, continuous with the thin, sharp, unreflected arcuate columella; umbilicated.

L. REFLEXA, Dall, *Alaska*.

It is *Lacunella*, Dall (not Desh), and *Lacunaria*, Dall (not Conrad.)

Section MEGALOMPHALUS, Brusina, 1871.

Shell naticiform, with short spire, normal apex, and rounded whorls, thin, minute, with a wide, plicate umbilicus. Operculum spiral.

L. AZONA, Brusina. *Mediterranean Sea*.

The species of this group were first described under *Fossarus*, from which they differ in apex, sculpture and operculum. Fischer considers *Megalomphalus* a member of the family Adeorbiidæ.

Section STENOTIS, A. Ad., 1863.

Shell compressed, elongately ovate, auriform; spire short, acute; whorls flattened, the last solute; aperture oblong, narrow behind, margin continuous, acute; umbilicus patulous, its margin angulate.

L. LAXATA, A. Ad. *Japan*.

Section CITHNA, A. Ad., 1863.

Shell shaped like *Lacuna*, but without epidermis (?); apex truncated or flattened, umbilicus defined by a ridge.

Tentacles ciliated. L. TENELLA, Jeffreys. *Europe, Japan*.

Hela, Jeffreys, 1870, is a synonym.

Subgenus LACUNELLA, Desh, 1861.

Shell oval, thin, pellucid, shining, apex obtuse; aperture large, dilated, with thin, expanded margin; columella narrow, thin, concave, divided by a narrow channel, scarcely perforate at the base. L. DEPRESSA, Desh. (Struct. & Syst. Conch., t. 69, f. 36.) Eocene; Paris basin.

Subgenus SPIRONEMA, Meek, 1864.

Shell ovate; whorls rounded, and separated by a rather deep suture; aperture ovate, lip thin, continuous; columella not thickened, perforated by a very small umbilicus; surface with revolving lines and furrows. L. TENUILINEATA, Meek and Hayden (Struct. & Syst. Conch., t. 69, f. 35.) Cretaceous. *Nebraska.*

FAMILY *FOSSARIDÆ.*

Head proboscidiform, with a median longitudinal sulcus; tentacles thread-like, sharp, grooved; eyes at their external base; two frontal lobes between the tentacles; foot obtuse at both ends.

Central tooth of the radula (Pl. 40, fig. 72) with a triangular, finely dentate cusp; lateral tooth transverse, with a strong cusp and a series of fine denticulations its entire length; marginals elongated, simple.

Shell turbinated, rather solid, white, grooved or ribbed spirally; aperture entire, lip simple, undulated, columella nearly straight. Operculum corneous, subconcentric or subspiral.

Genus FOSSARUS, Phil., 1841.

Shell perforate, subglobose, spirally ribbed, spire rather short, last whorl large; aperture semicircular, columellar margin nearly straight, outer lip rounded, undulated. Operculum concentrically grooved.

The nucleus of the shell is sharp, subcylindrical, of several whorls, caducous.

Animal having two frontal lobes.

About fifty living species have been enumerated; there are four fossil species, miocene of *Europe.* F. AMBIGUUS, Linn.

Maravignia, Aradas & Maggiore, 1841, is a synonym.

Section PHASIANEMA, S. Wood, 1842.

No frontal lobes.? Shell clathrate. F. SULCATUS, S. Wood, *Mediterranean* and pliocene.

Clathrella, Recluz, 1864, is a synonym.

Section ISAPIS, H. & A. Adams, 1854.

Shell umbilicated, spire elevated, cancellated, or with revolving ribs; columella with a small median tooth, sometimes obsolete, outer lip crenulated, interiorly grooved. *West Indies, Mazatlan.* F. ANOMALA, Adams.

Section COUTHOUYIA, A. Adams, 1860.

Shell ovate, profoundly, widely rimate; spire acuminated; whorls convex, decussated, with impressed suture; aperture semi-ovate; inner lip straight, dilated in front, outer lip arcuate, simple.

Japan. F. DECUSSATUS, A. Ad.

Section CONRADIA, A. Adams, 1860.

Turbinate, rimately umbilicated, spire somewhat elate; whorls convex, concentrically carinated; outer lip fimbriated, inner lip not dentate; umbilicus margined by a semilunar rib. F. CINGULIFERUS, A. Ad.

Japan.

Section GOTTOINA, A. Adams, 1863.

Shell spirally ribbed, solid, imperforate. F. SULCIFERUS, A. Ad.

Japan.

Section TUBA, Lea, 1833.

Shell conical, umbilicated; whorls rounded, cancellated; aperture rounded, margin not continuous above, columella thickened and reflected at the base. F. ALTERNATUS, Lea. Eocene.

Alabama.

Subgenus FOSSARIOPSIS, Laube, 1870.

Distinguished from *Fossarus* by its closed umbilicus, and the callous expansion of the inner lip. F. RUGOSO-CARINATUS, Klipst. Triassic.

Subgenus RAULINIA, Mayer, 1864.

Imperforate, rather thin, oval-oblong, spirally sulcate; outer lip simple, inner lip curved, with a central tooth. F. ALLIGATA, Desh. Miocene. F. BADIA, Tenison-Woods, is a recent Australian species.

Subgenus IPHITUS, Jeffreys, 1883.

Imperforate, conical, with spiral rows of tubercles, apex composed of a styliform process of several whorls, closely striated lengthwise; aperture rounded, entire, with simple lip. Operculum corneous, paucispiral. I. TUBERCULATUS, Jeffreys.

N. Atlantic O.

Genus FOSSARINA, Ad. & Ang., 1863.

Auriform, a little depressed, narrowly umbilicated, spire short; aperture oval, oblique, lips rounded. Operculum multispiral. F. PATULA, Ad. & Ang.

Australia.

Genus ATRESIUS, Gabb, 1869.

Elongated, spire elevated, whorls rounded; aperture ovate, slightly produced in front, outer lip entire, thin, columella not callous; imperforate; surface marked by spiral ribs. A. LIRATUS, Gabb. Cretaceous.

California.

Possibly belongs in Cerithiidæ.

No recent illustrated monograph of Fossaridæ has been published. Dr. Fischer printed a systematic Catalogue of the Species, with synonymy, in "Journal de Conchyliologie," for 1864.

Family *PLANAXIDÆ.*

Shell oval conic, spire elevated, without varices; columella flattened, truncate anteriorly, lip rounded, simple, notched in front. Operculum corneous, subspiral.

Animal with rather long rostrum, subulate tentacles and eyes on swellings at their base.

The Planaxidæ have been monographed by Sowerby, in Conchologia Iconica, xx.

Subfamily PLANAXINÆ.

Siphon very short, foot simple. Shell spirally grooved. Dentition (Pl. 40, fig. 69.)

Subfamily LITIOPINÆ.

Animal (Pl. 40, fig. 79.) No siphon, foot with three cirriform filaments, operculigerous lobe with two posterior filaments. Dentition (Pl. 40, fig. 70.) Shell minute, thin, smooth, plicate or spirally striate.

Planaxinæ.

Genus PLANAXIS, Lamarck, 1822.

Shell imperforate, oval-conic, solid, with epidermis, and elevated spire, usually spirally sulcate; columella callous, flattened, truncate at base, with a narrow sinus; interior of aperture ridged, base notched. Operculum paucispiral, with a nearly terminal nucleus.

Amphibious, crawling on stones near the margins of pools left by the retiring tide, or adhering to mangrove roots. About fifty species are known, tropical or subtropical. Fossil; pliocene of the *West Indies.* P. SULCATUS, Born.

Section HINEA, Gray, 1847.

Shell smooth, covered by an epidermis; whorls flattened; outer lip thick, sillonated within. P. BRASILIANUS, Lam.

Subgenus QUADRASIA, Crosse, 1886.

Shell smooth, spirally striated, imperforate; peristome thickened, the margins joined by a strong parietal callus, columella dilated with a rounded obtuse tubercle at the base, base of aperture emarginate. Operculum thin, corneous, paucispiral, the apex almost terminal. Fluviatile. Q. HIDALGOI, Crosse.

Philippines.

Perhaps more nearly related to Melanopsis.

Subgenus QUOYIA, Desh, 1830.

Conically elongated, apex decollated, whorls solid, flattened, spirally striated, mouth notched in front, grooved within, columella smooth, truncate in front, with a posterior spiral plication. P. DECOLLATUS, Quoy.

Fissilabra, Brown, 1836, and *Leucostoma*, Swains, 1840, are synonyms.

Subgenus HOLCOSTOMA, H. & A. Adams, 1853.

Shell thin, covered with a bristly epidermis, aperture with a posterior produced canal, with an anterior sinus, columella concave, with a posterior callus. P. PILIGERUS, Phil.

Indian Ocean.

Litiopinæ.

Genus LITIOPA, Rang, 1829.

Shell minute, conoidal, columella truncate at the base, outer lip simple, thin, notched in front. Operculum spiral.

Animal (Pl. 40, fig. 79) with three cirriform filaments on each side, operculigerous lobe with two posterior appendices, no siphon.

To ascend through the water this little pelagic animal emits an air bubble enclosed in a glutinous secretion, which draws out a thread as it rises, and finally attaches itself to floating sea weed. *Bombyxinus*, Belanger, 1834, is a synonym. L. MELANOSTOMA, Rang.

Subgenus ALABA, A. Ads., 1862.

Shell ovate-conical or elongated, subdiaphanous, whorls plicate or varicose, apex submammillate, columella often truncated, oper-

culigerous lobe with four filaments, tentacles obtuse at their extremities, the right one much longer.

A. PICTA, A. Ad. About 25 species.

Japan, Australia, Mazatlan, West Indies.

Subgenus DIALA, A. Adams, 1862.

Shell spirally striate, not varicose, sometimes a little nodulous around the middle, columella nearly straight, not truncate, lip simple. 5 sp.

Philippines, Australia, Japan.

D. VARIA, A. Ad.

(Subgenus STYLIFERINA, A. Ad., 1860.)

This group I have included in Eulimidæ (Manual, viii, 286); but Mr. Adams, in 1862, regarded it as a member of the Litiopidæ, in which opinion he has been followed by Watson and others. I introduce the group again, in order to include some new species by Watson, which may possibly really belong in Litiopidæ.

? FAMILY *GIRAUDIDÆ.*

Characters those of the following genus.

Genus GIRAUDIA, Bourg., 1885.

Shell oval, spire conoid, transparent, polished, without epidermis, last whorl extending upwards at the aperture half way upon the penultimate; aperture oval, superiorly angular, with a trace of a sinus, columella short, robust, enlarging below, peristome strongly thickened; imperforate. Operculum unknown. G. PRÆCLARA, Bourg. Fresh water. *Lake Tanganyika, Africa.*

As neither animal nor operculum are known, the only characters are those of the shell–which is unfigured. Bourguignat is unable to assimilate the group with any previously-known family.

Genus REYMONDIA, Bourg., 1885.

Shell oval-conoidal, more or less elongated, reddish chestnut color with a lighter sutural band, smooth, polished, without epidermis; last whorl slightly ascending at the aperture, then shortly deflected at the insertion of the strongly-thickened patulous lip, which is without external rib, columella with a longitudinal-curved ridge; no umbilicus. Operculum unknown. R. HOREI, Smith.

Lake Tanganyika.

Genus LITTORINA, Fer., 1821.

Section LITTORINA (sensu stricto.)

L. GRANDIS, Middendorff. Plate 41, fig. 80.

Solid, whorls a little concave round the upper part, smooth or obsoletely keeled, spirally striated towards the apex; bluish grey, the keels more or less interruptedly banded with chocolate, edge of lip with a few chocolate spots. Length, 40 mill.

Sea of Ochotsk.

L. SQUALIDA, Brod. & Sowb. Pl. 41, fig. 81.

Solid, slightly striate, greenish grey, with narrow chestnut bands, outer lip with chestnut markings, columella white, last whorl ventricose, a little concave above. Length, 1 in.

New Zealand.

L. LITTOREA, Linn. Pl. 41, figs. 82–85.

Solid, smooth, spirally striated, sometimes impressed round the upper part of the whorls; dark brown, olivaceous, yellowish or reddish, usually spirally lineated with a darker shade, interior of aperture chocolate brown. Length, 25–40 mill.

Europe; Northern Coast of United States (introd.).

This is the common edible periwinkle of Europe, which of late years has been observed as an inhabitant of the rocky coasts of the New England States, spreading southward with wonderful rapidity. The name periwinkle is supposed to be a corruption of petty winkle or whelk, in contradistinction to the whelk or winkle proper, which is *Buccinum undatum*. The extent to which this mollusk is consumed is indicated by the late Dr. Jeffreys, who states that in the Billingsgate Market of London, about 65,000 bushels are sold annually. They are also utilized in keeping oyster beds free of seaweed. Fig. 82 represents an abnormally-shouldered specimen.

The synonyms include *L. vulgaris*, Sowb., and *L. ustulatus*, Lam.

L. SITCHANA, Phil. Pl. 41, figs. 86–91; Pl. 45, fig. 12.

Subglobose, moderately solid, strongly spirally ridged, usually with subequal intervening furrows; dark chocolate color, often with a broad white peripheral band, interior chocolate.

Length, 15–18 mill.

Vancouver's Isl., northward; Japan and north coast of Asia.

This is very close to *L. rudis*, Donov., with which it has been identified by some of the Californian conchologists, and very possibly it is a variety of that species; but it appears to vary constantly

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in being much thinner, with coarser sculpture. The coloring varies to greenish grey, orange-yellow or reddish, the lighter colors often without a band; one variety is white, with a broad chocolate band

The synonyms include *L. Kurila* and *L. subtenebrosa*, Middend., *L. cincta*, Gould=*L. Gouldiana*, Weink., *L. castanea*, Ads. & Reeve, *L. rudis*, Cooper, *L. tenebrosa*, Schrenck, *L. Mandschurica*, Schrenck (fig. 86), a depressed variety.

Var. BREVICULA, Phil. Figs. 89, 90, 12.

Whorls somewhat slopingly flattened above, the last with from 3 to 5 spiral ribs, and smaller, more numerous ones on the base, the principal ribs subnodulous; olivaceous or brownish, variegated and strigated with white.

L. balteata, Reeve, and *L. Souverbiana*, Crosse (fig. 90), are synonyms.

North China.

Var. ALEUTICA, Dall. Fig. 91.

Spire depressed, the nodules on the ribs more developed.

Aleutian Is.

L. RUDIS, Donovan. Pl. 41, figs. 92–4.

Shell very solid, with short, sharp spire, smoothish, usually spirally linearly grooved; whitish, varying to orange-red, with sometimes a lighter or darker peripheral band; columella callous, flattened. Length, 15–22 mill.

Northern Europe and North Coast of the United States.

L. zonaria, Bean, and *L. simplex*, Reeve (fig. 96), from Cape Verd Is., are synonyms.

A very unstable species, as the following varieties testify:

Var. OBLIGATA, Say. Fig. 94.

Whorls more convex and thinner, spirally obsoletely ridged; columella broadly dilated, aperture a little produced below.

Greenland, New England.

L. castanea, Desh., *L. sulcata* and *L. Grœnlandica*, Menke, *L. incarnata*, Lovén, *L. costulata*, Midd., and *L. litorea*, Fabr., are synonyms.

Var. NIGRILINEATA, Gray. Fig. 95.

The engraved lines black.

Var. JUGOSA, Mont.

Smaller than usual, with strong, sharp spiral ridges, variable in number, and sometimes alternately larger and smaller.

Perhaps not distinct from Var. *obligata*.

Var. PATULA, Thorpe. Figs. 98–100.

Somewhat auriformly expanded, thinner; spire not prominent, placed somewhat obliquely; mouth wide.

England.

L. labiata, Brown, is a synonym.

Var. SAXATILIS, Johnston. Fig. 97.

Thinner, whorls more convex, subglobose, small, tessellated with olivaceous brown and white. Length, 9–12 mill.

In deferance to European authority, I include this as a variety of *L. rudis*, but it appears to me to be very distinct from that form, whilst it certainly shades gradually into the variety below.

L. neglecta, Bean, is a synonym.

Var. TENEBROSA, Montg. Figs. 1–4.

Thin, whorls rounded, with elevated spire; brownish or yellowish; usually tessellated with white. Length, 9–12 mill.

See remarks under foregoing variety.

L. vestita, Say., and *L. marmorata*, Pfr., are synonyms.

L. LITTORALIS, Linn. Pl. 41, figs. 5–8.

Rather solid, globosely ovate, with low pointed spire, whorls not very convex, suture scarcely impressed, surface smooth; yellowish, brownish, or brownish red, often with a faint, finely tessellated pattern, sometimes spirally banded or lineated. Length, 9–12 mill.

Lapland, Norway, Greenland, New England.

L. littoralis has usually been considered synonymous with *L. obtusata*, Linn., but I agree with Dr. Jeffreys in referring it to the species known in America as *L. palliata*, Say. It does not appear to occur on the British Coasts.

L. arctica, Moll. (figs. 6, 7), *L. limata*, Lovén, *L. tenebrosa*, var. *obtusata*, Midd. (fig. 5), are synonyms.

L. VENTRICOSA, Phil. Pl. 41, fig. 9.

Rounded oval, spirally engraved, sometimes granulated; whitish, with pale red streaks; columella excavated, and with aperture, flesh color. Length, 18 mill.

Pulo-Penang.

L. PORCATA, Phil. Pl. 41, fig. 10.

Umbilicated; coarsely spirally ribbed; bluish white, the excavated columella and interior of aperture chocolate color.

Length, 7 mill.

Galapagos Is.

CALIFO

Section MELARAPHE, Muhlf., 1828.

L. SCABRA, Linn. Pl. 42, figs. 18–20.

Rather thin, slantingly convex, somewhat coarsely spirally striated, periphery angulated and carinated, suture linearly channeled; yellowish or greyish, punctate or nebulously spotted, or interruptedly or continuously obliquely strigate with chocolate, interiorly similarly marked, with the color intensified on the inner margin of the lip. Length, 1–1·5 in.

Mazatlan, Sandwich Is., Viti Is., Philippines, China, Indian Ocean.

Including its varieties, this species stretches nearly around the world, extending from West Africa around to Arabia; but it has not been detected in the Mediterranean Sea.

The synonymy of the typical form embraces *L. angulifera*, Lam., *L. ahenea*, Reeve (in part), the vars. *rubra, suturalis, lutea, flammulata, articulata, punctata* (fig. 20), *ventricosa*, of Philippi, var. *concolor*, Weink., var. *tenuis*, Nevill.

Var. LINEATA, Gmel. Pl. 42, figs. 11–13, 15–17.

Thin, imperforate, finely, closely spirally striated, suture narrowly channeled, body whorl with rounded or scarcely angulated periphery, not carinated; yellowish or greyish, tessellated or obliquely irregularly strigate with chocolate, sometimes with a series of large chocolate spots next the suture. Length, 1·25 in.

West Coast of Africa, West Indies, Florida.

The history of the nomenclature of this variety or quasi-species is somewhat complicated. It was at first confounded by both Linnæus and Lamarck with the Polynesian form, which differs in being somewhat more coarsely striate with a carinate periphery. Subsequent authors, in distinguishing the species, have restricted Lamarck's species to the West Indian form, notwithstanding the significance of his name for it, and the fact that the only figure he refers to, as well as his description, clearly indicate the *L. scabra* of Linn. I have concluded to adopt for the present variety Gmelin's name, which appears to me to have been clearly intended for it.

L. scabra, of d'Orb. (figs. 12, 13), *L. ahenea*, Reeve, in part (fig. 11), perhaps *L. aurea*, Bonnet (fig. 17), described without locality, and the forms described by Philippi as vars. *flavescens, rubra* (fig. 16), *strigata* (fig. 15), belong here.

Var. INTERMEDIA, Phil. Plate 42, figs. 21–24.

Shell smaller, narrower, with engraved spiral lines, tessellated with chestnut and white, periphery angulated or carinated.

Length, 15–20 mill.

Sandwich Is., Central Polynesia, Ceylon, China.

To this are to be added vars. *articulata, punctata, strigata,* of Phil., var. *minor,* Weink., *L. Sinensis,* Phil. (fig. 23), *L. Newcombii,* Reeve (fig. 24), *L. Novæ-Hiberniæ,* Lesson.

Var. FILOSA, Sowb. Pl. 43, figs. 31, 31a; Pl. 42, figs. 25–30.

Whorls encircled by more or less distant thread-like ridges, and usually showing intermediate striæ; color sometimes pale, without variegated markings, sometimes strigated or tessellated, as in the type.

Japan, Philippines, Polynesia.

The synonyms of this variety include *L. pallescens,* Phil. (fig. 30), *L. arboricola,* Reeve (fig. 25), *L. Sieboldi,* Phil. (fig. 26), *L. Philippiana,* Reeve (fig. 27), *L. cingulata,* Phil. (fig. 29), *L. subcingulata,* Nevill, *L. carinifera,* Menke (fig. 28), *L. perdix,* King, *L. lævior,* Nevill.

Var. NEBULOSA, Lam. Pl. 43, fig. 38; Pl. 42, fig. 14.

Shell much thicker, ashy yellow, more or less nebulous, or with chestnut punctations, strigations or zigzag lines, densely spirally striate, periphery slightly angulated, aperture light yellowish.

Length, 1–1·25 in.

West Indies.

L. tigrina, d'Orb. (fig. 14), is possibly a synonym.

L. UNDULATA, Gray. Pl. 43, figs. 39–41.

Rather solid, smooth or spirally striate, yellowish or ashy white, with undulating chestnut strigations, sometimes tessellated or dotted, or suffused with chestnut or chocolate, with large white spots forming a row at the suture and another at the periphery; aperture yellowish, chestnut or violaceous, often with the markings of the exterior, columella flattened, violaceous. Length, 1 in.

Viti Is., Japan, Philippines, Java, Ceylon, etc.

Distinguished at once by its solidity and violet columella.

The synonyms include *L. conica,* Phil. (fig. 41), and its vars. *delicatula* and *subintermedia,* Nevill.

L. FLAMMEA, Phil. Pl. 43, figs. 34–36.

Narrow, thin, whorls slightly convex, the last with obscurely or distinctly angulated periphery, closely spirally striate; yellowish, tessellated or with zigzag markings of chestnut. Length, 20 mill.

China.

Thinner and narrower, and without the violet columella of the preceding species. In the form figured by Reeve as *L. Fortunei* (fig. 35), the peripheral angle is less prominent. *L. luteola*, Quoy. (fig. 36), also appears to be a synonym.

Our museum possesses specimens from Port Natal, South Africa, probably referable to this species.

L. ABERRANS, Phil. Pl. 43, fig. 32.

Thin, slender, with rounded whorls and deep suture, finely spirally striated, plicately decussated by growth lines; flesh white, the ridges opaque, lip and columella thinly reflected, tinged with violet; subperforate. Length, 18 mill.

Panama.

Described from a single specimen in the Cumingian collection. The locality has not been verified. Looks as much like a Bulimus as a Littorina.

L. STRIGATA, Lischke. Pl. 43, fig. 33.

Inflated, somewhat solid, spirally striate; yellowish, with interrupted chestnut spiral lines, forming oblique strigations.

Length, 9·5 mill.

Japan.

Distinguished by its short, bulbous form.

L. MELANOSTOMA, Gray. Pl. 43, figs. 42, 43.

Rather thin, whorls flattened, obliquely, obscurely subrugose, spirally distantly engraved, periphery angulated; straw color, with usually a longitudinal pattern of short, numerous, chestnut lines extending from sulcus to sulcus, either all over the surface or discontinued at the periphery; columella dark chocolate.

Indian Ocean, Ceylon, Java, Singapore.

Nevill has indicated a var. *articulata*, (fig. 43).

L. COLUMELLARIS, d'Orb. Pl. 43, figs. 37, 51; Pl. 44, fig. 79; Pl. 45, figs. 14, 15.

Stout, convex, thick, closely spirally striate, whitish, yellowish, purplish white or rust color, aperture light yellowish, columella excavated, flattened, violaceous. Length, 1 in.

West Indies, Brazil.

Frequenily named *L. Mauritiana*, Lam. in American collections; that, however, is a Polynesian and Australasian species, smaller, with chestnut or chocolate aperture having a white band near the base.

It is *L. Sayi*, Phil. not Reeve.

Var. FLAVA, Brod. Fig. 51.

Spiral sculpture stronger, one or two of them more prominent on the periphery, which thus becomes angulated.

Rio Janeiro.

L. Cubana, Weink. (figs. 79, 14, 15). is possibly a connecting link between this variety and the type of the species: it is evidently poorly figured, and I cannot identify any of our shells with it.

L. VARIA, Sowb. Pl. 43, figs. 44–46.

Rather thick, ventricose, convex, closely slightly striate, varying to cord like spiral ridges; yellowish white, spirally lineated with chestnut, often broken up into tessellated markings, and these frequently gathered into irregular oblique strigations, interior edge of lip spotted with chestnut. Length, 1·25 in.

Peru, Panama, Mazatlan.

The synonymy includes *L. fasciata*, Gray. (fig. 45), *L. variegata*, (fig. 46), *L. costulata*, Souleyet, and probably *L. bicarinata*, Gray.

L. PULCHRA, Sowb. Pl. 43, fig. 47.

Ventricose. a little flattened round the top of the whorls, densely spirally striate, thick, yellowish brown, with irregular oblique chocolate strigations, interior similarly colored. Length, 1·5 in.

Panama.

L. IRRORATA, Say. Pl. 43, figs. 48, 49, 50.

Whorls flattened, the last a little constricted above, swollen below, thick, spirally costulate; yellowish white, more or less clouded with light purple, apex purplish, the striæ bearing numerous minute chestnut dots, columella tinged with orange color, outer lip with chestnut marginal spots. Length, 1 inch.

Southern Coast of the United States, from Texas and Florida northward to Atlantic City, N. Jersey; Costa Rica, West Indies, Brazil.

It is only of recent years that this species has appeared so far northward as Atlantic City, where it was first detected by Mr. John Ford of Philadelphia. It is *L. Sayi* of Reeve (fig. 49), not Phil. *L. exarata*, Phil. (fig. 50).

L. SULCULOSA, Phil. Pl. 43, fig. 52.

Rather thin, whorls flatly convex above, spirally obtusely ribbed, with intervening broad grooves, periphery angulated; fawn color, ribs sometimes stained with livid purple. Length, 20 mill.

North Australia.

L. OBESA, Sowb. Pl. 43, fig. 53.

Solid, smooth, shining, very finely spirally grooved, periphery obtusely angulated, suture sometimes margined; flesh color or nearly white, aperture and columella orange-brown, the latter sometimes purplish. Length, 18–22 mill.

Sandwich and Viti Is., Philippines, Australia.

It is *L. coccinea*, Martyn, *L. limax.* (Mart.) Gray.

L. MAURITIANA, Lam. Pl. 44, figs. 71, 70–75.

Ash colored, often with a suffused or narrow darker band round the middle, smooth, or minutely spirally striated, periphery obtusely angulated, columella and aperture chestnut colored, the latter with a white band near the base. Length, 20–23 mill.

Mauritius, N. Zealand, Australia, Lord Howe's Isl.

L. laevis, Reeve, (fig. 72), "not Phil."=*L. pseudolaevis*, Nevill, *L. laevis*, Phil. (for I think Reeve's figure represents Phillippi's species), *L. unifasciata*, Gray, *L. Diemenensis*, Quoy, (fig. 73), *L. antipodum*, Phil. *L. Africana*, Reeve, not Phil. (fig. 75), *L. acuta*, Menke, *L. penitaria*, Wood, *L. luctuosa*, Reeve, (fig. 70), and *L. cincta*, Quoy, (fig. 74), are synonyms.

L. RUFA, Recluz. Pl. 43, fig. 54 (enlarged).

Rather solid, minute, slightly umbilicated, smooth, polished, orange brown, indistinctly banded with chestnut; aperture small, lip thick.

Hab. unknown.

Described by Reeve from a specimen named by Recluz, in the Cumingian collection; dimensions not given.

L. STRIATA, King. Pl. 44, figs. 58, 59.

Subglobose, whorls convex, rapidly enlarging, spirally sharply striate; ashy grey or brownish, aperture chocolate color with an inferior light band; columella widely excavated, chocolate above and below, flesh color in the middle. Length, 15–18 mill.

Azores, Cape Verd and Canary Is. Guinea.

It is *L. globosa*, Dkr. (fig. 59), *L. Canariensis*, d'Orb., *L. arenicola*, (Nutt.) Dunker, *L. affinis*, d'Orb.

L. PLANAXIS, Nuttall. Pl. 43, figs. 55, 56; Pl. 44, fig. 57.

Whorls convex, rapidly increasing, smooth or very minutely spirally striate, light chocolate color, shining, under a thin olivaceous epidermis, speckled and spotted irregularly with white, interior chocolate color, with a white band near the base; columella broadly excavated, yellowish brown.

California, Lower California.

The young shells are often beautifully variegated with bands and tessellations of chocolate and white, but these colorings rarely persist in the adults. Fig. 57 represents (enlarged) one of these young shells, described by Philippi under the name of *L. picta*, with a variety *marmorata*.

L. ambigua, Reeve (fig. 56) and *L. patula*, Gould are also synonyms.

L. PUNCTATA, Gmel. Pl. 44, figs. 60–64.

Ventricose, rather thin, smooth, polished, very minutely spirally striate, periphery obtusely angulated, last whorl a little concave below it; olive brown, tessellated with white, aperture chocolate colored, with an inferior white band. Length 12–15 mill.

West Africa, Mediterranean Sea.

The synonyms are *L. guttata*, Reeve (fig. 61), *L. Syriaca*, Phil.

Var. FRASERI, Reeve. Figs. 62, 63.

Livid purple, very minutely, numerously dotted.

West Africa.

Var. PULCHELLA, Dunker. Fig. 64.

Spirally engraved, flesh color, with purplish dots, interior chocolate.

West Africa, Teneriffe.

L. MELEAGRIS, Beck. Pl. 45, fig. 10.

Smooth, thin, flesh color or ashy, closely, usually regularly reticulated with chocolate, forming oblique series.

Length 8 mill.

West Indies.

L. guttata Phil. and *L. punctata*, Pfr. are synonyms.

L. AFRICANA, Krauss. Pl. 44, figs. 66, 65, 67–69.

Ash colored, smooth, spirally engraved, periphery angulated, aperture chocolate, with an inferior white band.

Length 10 Mill.

Cape of Good Hope, Natal.

L. decollata, Krauss (fig. 67) is a synonym; and perhaps *L. leucosticta*, Phil. (fig. 69), described without locality, is another.

Var. KNYSNAENSIS, Krauss. Figs. 65, 68.

Shell very minutely, elosely dotted with rust color.

L. picea, Reeve (fig. 68) is a synonym.

L. NOVÆ-ZELANDIÆ, Reeve. Pl. 44, figs. 76, 77.

Globosely turbinated, whorls rounded, with deep suture, irregularly spirally grooved, white or yellowish white, longitudinally marked with faint chestnut; interior of aperture chestnut color, with a white band near the base, columella violet tinted.

Length 19 mill.

New Zealand, Solomon Is.

L. melanacme, Smith (fig. 77), from the Solomon Is., is probably identical. Nevill changed the name to *L. erronea*, because he was convinced that the species does not come from New Zealand.

L. PERUVIANA, Lam. Pl. 44, fig. 78.

Whorls smooth, dark chocolate color, with zigzag longitudinal white markings, aperture chocolate color. Length 22 mill.

Central America to Chili.

Nevill has indicated, without description, a var. *nana*.

L. ASPERA, Phil. Pl. 44, figs. 80–85; Pl. 45, fig. 87.

Coarsely, sharply, spirally ribbed, whitish, longitudinally lineate with chestnut, columella and aperture chocolate or chestnut color.

Length 16 mill.

Panama to Mazatlan.

L. puncticulata, Phil. (fig. 83), and var. *fortisulcata*, Nevill are synonyms. *L. irrorata*, Reeve (fig. 87), said to come from Sitka, can probably be added.

Var. CONSPERSA, Phil. Figs. 82, 80–83.

Thinner, the spiral sculpture closer and flatter, whitish, sometimes with spiral series of chestnut dots, interior light chestnut.

Typical specimens of this variety and of *L. aspera* appear very different in texture, sculpture and coloring, but in large series intermediates are not uncommon.

L. albida, Phil. (fig. 81) and *L. modesta*, Menke (fig. 80), are synonyms.

Var. PHILIPPII, Carpenter. Fig. 84.

Obliquely strigate with greyish chocolate.

Var. PENICILLATA, Carpenter. Fig. 85.

Small, flatly, closely spirally striate; ash color, with irregular longitudinal chestnut lines and two distant bluish spiral lines.

Length 6 mill.

Cape St. Lucas, L. Cal.

L. PINTADO Wood. Pl. 44, fig. 86; Pl. 45, fig. 88.

Yellowish white or greyish, smooth or slightly, closely, spirally striate, whole surface covered by very minute, close chestnut dots, aperture yellowish chestnut with darker spiral lines.

Length, 16–24 mill.

Sandwich Is.

The synonyms are *L. serialis*, Souleyet, *L. ambigua* and *L. tenebrata*, Nuttall, (fig. 88).

L. PAYTENSIS, Phil. Pl. 45, figs. 90, 91, 95, 96.

With distant engraved lines, and angulated periphery, whitish, punctate with chestnut and with an obsolete chestnut band, aperture chestnut color, with two pale bands. Length, 12 mill.

Payta, Peru.

I am not acquainted with this species, *L. Araucana*, d'Orb. (figs. 95, 96), is probably identical.

L. CINGULIFERA, Dunker. Pl. 45, fig. 97.

Obsoletely spirally, engraved, white or ash color with spiral chestnut lines, aperture bluish, with chestnut lines. Length, 12 mill.

Guinea, W. Africa.

L. SCUTULATA, Gould. Pl. 45, figs. 98–3.

Faintly striate with spiral impressed lines, olivaceous chestnut or chocolate color, including aperture, sometimes not variegated, but usually with longitudinal zigzag white markings, sometimes broken up into spots, and frequently with an articulated white and chestnut band on the periphery. Length 9–12 mill.

Washington Territory to *Southern California.*

The variations of this beautiful species are too numerous for description: several of them have received names; such as *L. plena*, Gould, (fig. 1), *L. lepida*, Gld. (fig. 2), *L. pullata*, Carp. (fig. 3).

L. TESSELLATA, Phil. Pl. 45, fig. 89.

Shell rather thin, whorls convex, the last very obtusely angulated on the periphery, closely lineately grooved and finely tessellated

with square light chestnut and white spots, aperture and columella light purplish, the former showing the exterior markings.

Length 18 mill.

West Indies.

Rather a rare form, more inflated than those which follow. It is possible that *L. tigrina*, d'Orb. doubtfully referred to *L. scabra*, var. *nebulosa* (p. 243), should be placed here. *L. tigrina*, C. B. Ad. (Mörch), and *L. undulata*, d'Orb. are synonyms.

L. ZICZAC, Chemn. Pl. 45, figs. 5–7, 92.

Sculpture varying from smooth to spirally striate, periphery from obtusely angulated with slightly convex whorls to strongly carinated with nearly flat whorls, stout or slim; white, with a bluish cast and zigzag longitudinal chestnut lines, the latter sometimes faint (generally so in large specimens), but often stronger and closer, the blue clouding intensified on the middle of the body whorl, and the whole appearance thus becoming much darker, as though forming the ground color, with the strigations white; aperture light or dark chocolate or bluish, often with a light band near the base, sometimes with a second superior light band. Length 10–25 mill.

West Indies, Florida, Brazil.

The light colored, larger variety, with very obtuse angle, is usually known in American collections as *L. lineata*, Lam. *L. debilis*, Phil. (fig. 7) is a half-grown one, and *L. glabrata*, Phil. (fig. 92), said to be from Payta, Peru, is full-grown. *L. d'Orbigniana*, Phil. may be added.

Of the darker colored and more angulated forms, the wide, stumpy specimens have been distinguished as *L. floccosa*, Beck, and *L. glaucocincta*, Beck, *L. cingulata*, Pfr. *L. Riisei*, Mörch are synonyms; whilst the narrower forms (typical *ziczac*) include *L. angustior*, Mörch, and its var. *fasciata*, *L. carinta*, d'Orb and *L. Jamaicensis*, Ads.

L. PUSILLA, Phil. Pl. 45, fig. 8.

Decollated, slightly spirally striate, bluish white, with dark chestnut longitudinal, oblique lines; last whorl obsoletely carinated; aperture chocolate color, with a basal white band, and variegated outer lip. Length, 5 mill.

Sandwich Is.

L. COLUMNA, Jonas. Pl. 45, fig. 9.

Solid, closely spirally striated, whorls rounded, the last with deep suture and without carina; whitish, with longitudinal chestnut

strigations, interior violaceous, with a wide yellowish band, lip maculated within. Length, 16·5 mill.

Hab. unknown.

Described from a single specimen.

L. MINIMA, Gray. Pl. 45, fig. 11.

Slightly umbilicated, smooth, white, with scattered small chocolate spots. Length, 5–8 mill.

West Indies.

L. NERITOIDES, Linn. Pl. 45, fig. 13; Pl. 46, fig. 18.

Whorls smooth, slightly impressed round the upper part, olivaceous grey, with a central chocolate band, aperture chocolate color, with a white band at the base. Length, 5–7 mill.

Southern Europe, Madeira.

The synonymy includes *L. cærulescens*, Lam. *L. Basterotii*, Payr. *L. elegans*, Risso, *L. glabrata*, Pfr. *L. melanostoma*, Kryn. *L. Petræus*, Mtg. *L. saxatilis*, Olivi, *L. tricolor*, Risso, and Var. *paupercula*, Monts.

L. thersites, Reeve (fig. 18), said to come from the coast of Chili and Peru does not appear to possess any distinctive characters; the locality needs confirmation, and may be regarded as very doubtful.

L. MESPILUM, Muhlf. Pl. 45, figs. 16, 17.

Smooth, solid, subglobose, with more convex whorls than in the preceding species; chestnut colored, often with a darker band, aperture chestnut, without band; umbilicus frequently subrimate.

Length, 5–7 mill.

West Indies.

L. fusca, Pfr., *L. Gundlachi*, Phil., and *L. naticoides*, Orb. (fig. 17), are identical.

L. ACUMINATA, Gould. Pl. 46, fig. 19.

Solid, shining, livid with darker flames or interrupted strigations, often maculated with white on the periphery and at the suture; whorls 6, planulate, the last subangulate, with spiral striæ; columella tinted with mulberry color. Length, 7·5 mill.

Mangsi Isl., Sooloo Sea.

Section NERITOIDES, Brown, 1827.

L. OBTUSATA, Linn. Pl. 46, figs. 20–22, 23.

Subglobose, with scarcely elevated spire, whorls flattened, suture not deep, last whorl a little tumid above, compressed on the side,

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thick, imperforate, smooth, or obscurely engraved-striate; light yellowish to dark chocolate color, sometimes with two bands.

Length, 12 mill.

Northern Europe.

It is *L. littoralis*, Forbes & Hanley, *L. retusa*, Lam., *L. ustulatus*, Blainv., *L. neritiformis*, Brown.

Var. L. FABALIS, Turton. Fig. 22.

Light yellowish red, closely reticulated or zigzagged with darker lines. Scarcely deserves to be distinguished as a variety, as many of the darker colored specimens of the full-grown *L. obtusata* very indistinctly preserve these markings.

L. Beanii, Macgill., and *L. vittata*, Phil., are the same.

Var. ÆSTUARII, Jeffreys. Fig. 23.

Smaller, with more elevated spire, uniform greenish brown, the aperture chestnut color. Length, 10 mill.

Near Sutton, and at Manningtree, Suffolk, England.

Inhabits between tide marks in brackish water. In deference to Dr. Jeffreys' opinion, I quote the species here, but specimens received from him, appear to me to be rather allied to *L. littoralis* than to this species.

L. UMBILICATA, d'Orb. Pl. 46, fig 24.

Smooth, or with a few spiral striæ anteriorly; blackish or bluish black. Length, 1·5 mill.

Peru and Bolivia.

Evidently a very young shell; its mature characters it would be unsafe to surmise.

Section LAMELLILITORINA, Tryon, 1887.

L. ALBICANS, Metcalfe. Pl. 46, figs. 25, 26.

Whorls rounded, spirally linearly grooved, obtusely keeled at the suture, last whorl lamellarly varicose, thin, semitransparent; white, purple tinted towards the apex, filleted with chestnut at the keel, lip thinly reflected. Length, 22 mill.

Sarawak, Borneo.

L. ARDOUINIANA, Heude. Pl. 46, fig. 28.

Spirally striate, thin, epidermis marbled with white, body whorl with several longitudinal lamellæ. Length, 20 mill.

Along, Tonquin.

Described as a doubtful Leptopoma, and by Mr. Crosse, referred to Littorina; very possibly a variety of *L. albicans.*

L. TENUIS, Phil. Pl. 46, fig. 27.

Very thin, thinly spirally striate, whorls often tumid above, then flattened, with obtusely angulated periphery; whitish with faint angular longitudinal chestnut lines, epidermis yellowish, obliquely, faintly lamellar. Length, 14 mill.

Ins. Ticao, Philippines.

Section LÆVILITORINA, Pfeffer, 1886.

L. CALIGINOSA, Gould. Pl. 46, fig. 29.

Smooth, or with slight incremental striæ, thin, epidermis chestnut color or olivaceous brown, sometimes maculated with yellow; whorls 4–5, ventricose, with deep suture; interior livid or chestnut colored. Length, 5 mill.

Terra del Fuego; South Georgia.

L. VENUSTA, Pfeffer. Pl. 46, fig. 30.

Inconspicuously rimate, thin, olivaceous corneous, three banded with chestnut, with a very thin epidermis; whorls 4½, with deep suture; aperture bluish-ash color, with bright purplish bands. Length, 5·6 mill.

South Georgia.

L. GRANUM, Pfeffer. Pl. 46, fig. 31.

Rimate, thin, slightly longitudinally, and distantly, obscurely, spirally striate, light corneous, under a membranaceous yellowish epidermis; whorls 4½, the last a little inflated; aperture corneous. Length, 1·6 mill.

South Georgia.

L. PYGMÆA, Pfeffer. Pl. 46, fig. 32.

Strongly pitted-umbilicate, thin, chitinous, with thin longitudinal plications and spiral indistinct striæ, reddish brown, under a thin epidermis of the same color, columella violaceous, outer lip black-margined. Length, 2 mill.

South Georgia.

L. UMBILICATA, Pfeffer. Pl. 46, fig. 33.

Very distinctly umbilicated, thin, with a peripheral carina and a distant one above it, longitudinal sculpture obsolete, epidermis very thin, smooth, ochry olivaceous; whorls 5, convex, suture strongly coarctate; interior light chestnut color. Length, 3 mill.

South Georgia.

The specific name is preoccupied by d'Orbigny for a doubtful species.

L. HISSEYANA, Tenison-Woods. Pl. 46, fig. 35.

Narrowly rimate, spirally striate, thin, greyish, yellowish or orange-red, apex violaceous, sometimes with a broad darker peripheral band. Length, 3 mill.

Tasmania.

L. PALUDINELLA, Reeve. Pl. 46, fig. 36.

Subglobose, thin, horny, with impressed suture, smooth, olivaceous chestnut, aperture yellowish chestnut, columella excavated.

Length unknown; figure magnified.

Tasmania.

Section PELLILITORINA, Pfeffer, 1886.

L. SETOSA, E. A. Smith. Pl. 46, figs. 37, 38.

Imperforate, thin, yellowish corneous, epidermis stout, olivaceous brown, with numerous short erect hairs disposed in longitudinal and spiral series; whorls over 5, decussated beneath the epidermis; interior pearl colored. Length, 14 mill.

Kerguelen Isl.

L. PELLITA, Marts. Pl 46, figs. 39–41.

Thin, greyish brown, epidermis covered by spirally arranged series of curved hairs, beneath the epidermis punctate and cancellate; whorls 4, convex, a little flattened at the suture; columella yellowish or violaceous. Length, 18 mill.

South Georgia.

Section AQUILONARIA, Dall., 1886.

L. TURNERI, Dall. Pl. 46, fig. 42.

Imperforate, very thin, white, under a tough, shaggy, brownish epidermis, which, near the aperture, forms the entire substance of the shell. Length, 14 mill.

North Labrador; Arctic Ocean, north of Behring's Strait.

Unfigured and doubtful Species of Littorina.

L. VIDUA, Gould.	*Japan.*
L. VARIA, Hutton.	*New Zealand.*
L. LUNATA, H. C. Lea.	*Cape May, New Jersey.*
L. BLANFORDI, Dunker.	*Rockhampton, Australia.*
L. APICINA, Menke.	*Mazatlan.*
L. PARVULA and L. PHASIANELLA, Phil.	*Panama.*
L. BECCARII, Canefri.	*Papuan Is.*
L. PULCHELLA, Ad. (= L. ADAMSI, Reeve.)	*Jamaica.*

Belongs to the Trochidæ.

Genus CREMNOCONCHUS, Blanford, 1869.

C. SYHADRENSIS, Blanford. Pl. 46, fig. 47.

Subcovered-perforate, with elevated spiral ribs, with the interstices decussated by smaller spiral liræ and incremental striæ, epidermis olivaceous brown; whorls 3, rapidly increasing, the last angulated round the umbilicus. Length, 7 mill.

Western Ghats, near Bombay, India.

C. CONICUS, Blanford. Pl. 46, figs. 44–46.

Imperforate, solid, whitish, often with a chestnut band above the periphery, epidermis olivaceous, not shining, suture deep; whorls 5, convex, the last subangulate at the periphery; aperture fulvous or whitish, often banded. Length, 8–9·5 mill.

Torna, near Poona, India.

L. Fairbanki, Blanford (fig. 45), appears to be a synonym.

Var. CANALICULATUS, Blanford. Fig. 46.

Suture channeled, the whorls acutely carinate at the top.

Var. EDECOLLATA, Nevill.

Stoliczka considered *C. conicus* a variety of the next species, and Nevill believes this probable.

C. CARINATUS, Layard. Pl. 46, fig. 43.

Subperforate, solid, whitish, with a chestnut band above the periphery, carinated at the periphery and suture, with a sutural channel; whorls 5, rapidly increasing; aperture whitish, chestnut banded. Length, 7·5 mill.

Mahableshwar, India.

The preceding species, perhaps, ought to be united with this.

Var. GIGANTEA, Nevill.

Bombay Presidency, India.

Genus TECTARIUS, Val., 1833.

T. PAGODUS, Linn. Pl. 47, fig. 48.

Spirally tuberculârly ribbed, the tubercles in oblique longitudinal series, last whorl encircled by two spinose carinæ, those of the spire by one, yellowish white, often stained with chestnut brown, or the spiral sculpture lineated with that color; columella white, slightly tuberculated below, aperture ridged within.

Length, 2·5 in.

Australia, Moluccas, Ceylon, Zanzibar.

T. bicolor, Lam., is a synonym.

T. BULLATUS, Martyn. Pl. 47, figs. 49–51, 53, 58.

Shell thicker than the preceding species, imperforate, spinose-papillary upon spiral ribs, the interstices closely spirally lirate, suture often channeled by the exsertion of a row of spines above it; whorls often somewhat angulated by the greater prominence of a pair of peripheral nodulous ribs; cream white, reddish tinged towards the summit; columella toothed below, aperture lirate within. Length, 1·5 in.

Indian Ocean, Australia, Polynesia.

T. grandinatus, Chemn., *T. papillosus*, Lam., *T. coronatus*, Val., and vars. *vera, subinermis, rustica, quadriseriata* and *elegans*, of Phil., are synonyms. *T. spinulosa*, Phil. (fig. 58), is a juvenile.

Var. CORONARIA, Lam. Fig. 53.

Shell longer, the spines shorter and smaller.

Connects insensibly with the type, although formerly considered a distinct species.

T. TECTUM–PERSICUM, Linn. Pl. 47, fig. 52.

Spiny tubercles larger, more compressed, blunter than in *T. bullatus*, usually fewer spiral series; cream color, often lineated with chestnut. Length, 30 mill.

Zanzibar, Madagascar, Mauritius.

Notwithstanding its more rugose appearance, I think it probable that this will prove to be a mere variety of *T. bullatus*.

T. CUMINGII, Phil. Pl. 48, fig. 73.

Deeply umbilicated, umbilicus defined by an angle, encircled by spinose ribs, of which two are very prominent on the body whorl and one on the spire, irregularly granularly lirate between them, flesh color, interior light orange-brown, not ridged, columella not toothed. Length, 22 mill.

Philippines, Polynesia.

The type of Gray's section Nina. It is *T. echinulatus*, Kiener.

T. ARMATA, Issel. Pl. 47, fig. 54.

Imperforate, thick, solid, spirally granularly costate, with a peripheral series of compressed spines, appearing on the whorls of the spire, yellowish white, aperture lirate within, columella subdentiform below. Alt. 14 mill.

Two of the figures of *T. tectum-Persicum*, in Küster's Monograph of Littorina, refer to this species.

Suez.

T. TECTIFORMIS, Watson. Pl. 47, fig. 55.

Umbilicated, with longitudinal plications, small at the suture, then becoming evanescent, but reappearing more prominently at the periphery, where they become tubercles on the carina, vanishing on the flattened base, peripheral carina visible on the spire-whorls, whole surface covered by fine, unequal spiral threads; yellowish white. Length, ? 22·5 mill.

Japan; 565 fms.

The apex and base of the single specimen obtained were broken. Watson is not certain of the generic position of this shell, which was obtained by the Challenger Expedition.

T. MURICATUS, Linn. Pl. 48, fig. 68.

Imperforate or rimate, solid, yellowish or greyish white; whorls rounded, a little flattened below the suture, encircled by close series of granules, the series either in juxtaposition or with intermediate spiral striæ; aperture light chestnut color, usually smooth within, or very faintly ridged. Length, 1 in.

West Indies, Bahamas, Florida.

This species has been known to live about a year in a cabinet, deprived of its native element.

T. NODULOSUS, Gmel. Pl. 47, figs. 59–64; Pl. 48, figs. 72, 74, 75.

Bluish grey, spirally striate, whorls biangulate in the middle, the angles tuberculated, usually yellowish white, aperture and columella chestnut or chocolate color, the former often obsoletely banded, base of aperture a little produced. Length, 18 mill.

North Carolina, Bahamas, West Indies, Ceylon, Philippines, Australia, New Zealand, Marquesas.

T. dilatatus Orb. (fig. 60), *T. tuberculatus*, Menke, *T. thiarella*, Anton. (fig. 59), *T. trochiformis*, Phil., *T. nodulosus*, d'Orb., not Gmel., *T. tuberculatus*, Gray (fig. 74), *T. Antoni*, Phil., *T. scabra*, Anton., are all synonyms referring to the American form, generally known as *T. dilatatus;* whilst the oriental examples have been heretofore known as *T. nodulosus* (fig. 75), with *T. trochoides*, Gray (fig. 61), *T. vilis*, Menke (fig. 64), *T. Malaccana*, Phil. (fig. 63), *T. monilifera*, Soul. (fig. 62), *T. pyramidalis*, Quoy. (fig. 72), and *T. trochiformis*, Dillw., as synonyms. My sufficient justification in uniting species with such distant habitats, and no intermediate localities, is that it is impossible to distinguish them by any character.

T. MONTROUZIERI, Fischer. Pl. 47, figs. 56, 57.

Thick, whitish, light flesh color near the suture, spirally cingulate and longitudinally costate, the intersections forming close series of nodules; aperture sulcate within, basal margin plicate, columella white, subdentate at the base. Length, 10 mill.

New Caledonia.

T. NODOSUS, Gray. Pl. 47, figs. 66, 65, 67; Pl. 48, figs. 83–86.

Spirally striate, with three spiral ribs, which are more or less nodose, yellowish or greyish, sometimes indistinctly banded or marbled with chestnut, the ribs, in fresh specimens, chocolate colored, interrupted by the white tubercles, interior chestnut or chocolate color, light-banded at the base. Length, 18–21 mill.

Indo-Australian, South Africa.

Fig. 66 represents the typical form; a more elate, worn specimen is represented in *T. subnodosus*, Phil. (fig. 65.)

T. Natalensis, Krauss (fig. 67), and *T. lemniscata* Phil. (fig. 86), are also synonyms.

T. MILIARIS, Quoy. Pl. 48, figs. 78, 76, 71, 82, 77, 69.

Short ovate, closely spirally striate, the striæ nodulous above the rounded periphery, bluish grey, mottled with greyish white, columella and aperture chocolate color, the latter with a basal white band. Length, 13 mill.

Ascension Isl., Viti Is., Australia.

T. echinatus, Anton., *T. granocostatus*, Reeve (fig. 82), *T. Feejeensis*, Reeve (fig. 76), and perhaps the doubtful *T. reticulatus*, Anton (fig. 71), of unknown habitat, are synonyms.

Var. GRANOSUS, Phil. Pl. 48, fig. 77, 69.

Subconical, whorls flattened above, with an obtuse peripheral angle, roughly granulated by longitudinal, crossed by spiral ridges, the granules smaller, in spiral series on the base, bluish grey, more or less marbled, columella and interior chestnut color or bluish.

Length, 12 mill.

Fernando Po.

Frequently narrower, and more elate than the specimen figured.

T. glans, Reeve (fig. 69), is a synonym.

T. RUGOSUS, Menke. Pl. 48, fig. 70.

Solid, imperforate, tumidly convex, spirally linearly grooved, longitudinally strongly ribbed, the intersections forming tubercles

on the upper part of the whorls, flesh white, interior yellowish, columella flesh purple. Length, 22 mill.

Mouth of Swan River, Australia.

T. GRANULARIS, Gray. Pl. 48, figs. 84, 85, 79–81; Pl. 45, fig. 4.

Ovately ventricose, closely spirally striate, the striæ minutely granose on the upper part of the whorls, yellowish white or ash colored, sometimes marbled, columella and aperture chocolate color, the latter with a white basal band. Length, 9 mill.

Loochoo and Viti Is., Red Sea, Japan.

L. millegrana, Phil. (fig. 85), *T. cinereus*, Pease (fig. 81), *T. Vitiensis*, Dunker, *T. plena*, Godeffr. Cat., *T. radiata*, Souleyet (fig. 4), *T. exigua*, Dunker, *T. ventricosa*, Phil., are synonyms.

Var. SUBGRANOSUS, Dunker. Figs. 79, 80.

Whorls slightly shouldered.

Madras.

Unfigured Species of Tectarius.

T. CECILLEI, Phil.	*Loochoo Is.*
T. LUTEA, Gould.	*China Sea.*
T. RUBRA, Anton.	*Hab. unknown.*

Genus MODULUS, Gray, 1840.

M. TECTUM, Gmel. Pl. 48, figs. 87–89.

Subperforate, inflated, tumidly convex above, with distant, rounded, oblique plications, spire depressed, suture well impressed, whole surface spirally striate, striæ often alternately larger; whitish, marbled and lineated with light chestnut, aperture white, closely ridged, sometimes chestnut margined. Diam. 28 mill.

Sandwich and Viti Is., Indian Ocean, Red Sea, Mauritius.

M. retusus, Brug., *M. obtusatus*, Phil. (fig. 89), *M. cidaris*, Reeve (fig. 87), *M. candidus*, Petit (fig. 88), are synonyms.

M. FLORIDANUS, Conr. Pl. 48, fig. 90.

Suborbicular, whorls convex above, with subnodular radiating ribs, terminating above a peripheral spiral rib; below the periphery are several spiral, subnodular ribs and equal interspaces, which are striated; whitish, with chestnut small spots on the ribs, interior white or violaceous. Diam. 15 mill.

West Coast of Florida.

M. LENTICULARIS (Chemn.), Auct. Pl. 48, figs. 91, 92.

Flattened above, with distant radiating ribs, periphery acutely carinated, defined by a rib, convex below, everywhere minutely spirally corded, spire-whorls often exserted sufficiently to show the carina; whitish, articulated with reddish chestnut.

Diam. 15–18 mill.

West Indies.

Distinguished at once from the preceding species by the flatter top, and stronger carina, It is *M. modulus*, Linn., and *M. filosus*, Helbling.

M. DISCULUS, Phil. Pl. 48, figs. 93, 94; Pl. 49, fig. 95.

Spire conical, more elevated than in the preceding species, the distant radiating ribs forming by their terminations a series of tubercles on the sharply carinated periphery; base flatly convex, with close, subnodulous spiral cords; white, tessellated with chestnut at the suture and periphery, aperture violaceous. Diam. 10 mill.

Acapulco, Mazatlan.

M. dorsuosus, Gould. (fig. 95), and perhaps *M. lividus*, Phil., are synonyms.

M. CERODES, A. Ad. Pl. 49, figs. 96, 97.

Depressed, distantly radiately ribbed, the ribs projecting at the carinate periphery, where they are cut by two or three impressed spiral lines, base with several revolving riblets, two of which are larger and tuberculate. Diam. 12 mill.

Mozambique (Cuming), *Gulf of California* (Carpenter.)

The two series of tubercles often unite into one.

M. UNIDENS (Lister), Auct. Pl. 49, figs. 98–100.

Conical, whorls flattened, obsoletely, radiately, distantly ribbed above the angulated periphery, everywhere closely spirally corded; white, the cords minutely punctate with reddish chestnut.

Diam. 15 mill.

West Indies, West Coast of N. America, Philippines, etc.

The synonymy includes *M. angulatus*, C. B. Ad., *M. Sayi* (Nuttall), A. Ad., *M. trochiformis*, Eyd. et Soul. (fig. 100), *M. perlatus*, Dillw., *M. Carchedonicus*, Lam., *M. catenulatus*, Phil.

M. MORELETI, Fischer. Pl. 49, figs. 1, 2.

Narrowly subperforate, rather thick, spirally lirate, carinate, the body whorl bicarinate; lip thick, sub-bilabiate; whitish, the upper

part radiately maculated with chestnut, the base minutely punctate.
Diam. 2 mill.

New Caledonia.

Unfigured Species.

M. OBLIQUUS, A. Ad. *Red Sea.*
M. DUPLICATUS, A. Ad. *Hab. unknown.*
M. KREBSII, Mörch. *West Indies.*
M. CONVEXIOR, M. PISUM, M. CANALICULATUS, (Beck) Mörch. *West Indies.*

Genus RISELLA, Gray, 1840.

R. MELANOSTOMA, Gmel. Pl. 49, figs. 99, 3–29; Pl. 50, figs. 30, 31.
Conically elevated or depressed, with rounded, somewhat tuberculated periphery on the elevated specimens, acutely carinated on the depressed ones, radiately ribbed above, or nearly smooth, spirally striate, most distinct on the base; yellowish or olivaceous brown, more or less articulated with chestnut, sometimes obliquely longitudinally strigate, aperture dark chocolate color, varying to orange brown, lip brown spotted. Length, 15 mill.

South Australia, Tasmania.

R. aurata, Quoy (fig. 6), *R. imbricata*, Gray (figs. 8, 9), *R. Kielmanseggi*, Zelebor (fig. 7), *R. vittata*, Phil. (figs. 28, 29), *R. lutea*, Quoy (fig. 3), *R. plicatula*, Phil. (figs. 24, 25), *R. cicatricosa*, Jonas (figs. 4, 5), *R. nana*, Lam. (figs. 99, 13, 14), *R. picta*, Phil. (figs. 16, 17), *R. plana*, Quoy (figs. 10, 11, 12), *R. livida*, Phil. (figs. 30, 31), *R. Australis*, Gray, *R. grisea*, Phil. (figs. 18, 19), *R. fimbriata*, Phil. (figs. 26, 27), *R. flavescens*, Phil. (figs. 22, 23), *R. Bruni*, Crosse, (fig. 15), and probably *R. crassa*, Dunker, are all synonyms.

In the range of varieties presented by this assemblage, we find the shell high, with a roundly angular periphery, or low with a sharp periphery, all degrees of development of the radiating ribs, sometimes entirely wanting, or replaced by color strigations, etc. I have endeavored, in vain, to eliminate distinct or even varietal forms, and at last put them all together. This was practically done ten years ago by Rev. J. E. Tenison Woods (Proc. Linn. Soc. N. S. Wales, i, 242, 1876), and more recently Mr. E. A. Smith (Zool. Alert Exped., p. 62), has partially concurred. The collection of specimens before me is sufficiently large and varied to give me abundant evidence in support of the Australian conchologist's

views. I retain Gmelin's name for the species, although it cannot be satisfactorily identified, because it is the oldest name, and by common consent for many years has been generally applied to one or another of the above forms.

Subgenus PEASIELLA, Nevill., 1884.

R. TANTILLA, Gould. Pl. 50, figs. 32, 33, 34.

Perforate, whorls 4–5, flattened, with carinate periphery, obliquely very finely striate, base with two spiral granular threads; yellowish ash, sometimes showing radiating, flexuous chestnut lines, aperture orange-brown. Diam. 4–5 mill.

Sandwich Is., Viti Is., Australia, Ins. Nossi-bé.

It is *Margarita angulata*, A. Ad., *Trochus diminutivus*, Reeve (fig. 34), *R. parvula*, Dunker, var. *subinfracostata*, Nevill.

R. CALEDONICA, Crosse. Pl. 52, fig. 9.

With wide funnel-shaped umbilicus defined by a carina, another carina on the periphery, a third at the suture, microscopically striate longitudinally, yellowish brown; whorls 4, angulated by the carinæ, rapidly increasing, base flatly convex. Diam. 2·25 mill.

New Caledonia.

Described as a Fossarus. It appears to differ from the other species by its wider umbilicus.

R. GAIDEI, Montr. Pl. 50, figs. 35–37.

Umbilicated, spirally striated, periphery acutely carinated and denticulate by the projection of longitudinal, rounded ribs; yellowish white, spirally articulated with brown above the periphery and on the base. Diam. 2·75 mill.

Lifou, Loyalty Is.

R. CONOIDALIS, Pease. Pl. 50, fig. 38.

Narrowly perforate; whorls flatly sloping, spirally grooved, plicately longitudinally wrinkled, undulating the carinal line, base flatly convex, finely grooved; whitish, stained with saffron yellow. Diam. 4 mill.

Paumotus.

R. ISSELI, Semper. Pl. 50, figs. 39, 40.

Umbilicated, spirally engraved above, costate on the base, upper part with low, broad, rounded undulations or ribs, modifying the carinated periphery; yellowish, articulated with brown at the suture and periphery. Diam. 2·5 mill.

Suez, Zanzibar.

R. INFRACOSTATA, Issel. Pl. 50, figs. 41, 42.

Narrowly umbilicated, minutely radiately striate above, concentrically, distantly costulate below; whorls somewhat convex, the last with peripheral carina; yellowish, maculated with brown at the suture and periphery. Diam. 2 mill.

Suez.

R. Sismondi, Issel, Mss., is a synonym.

Possibly only a variety of the preceding species.

R. ROEPSTORFFIANA, Nevill. Pl. 50, fig. 43.

Narrowly perforate, nearly smooth above, suture not subimbricated, periphery rarely undulately waved; yellowish, sometimes with a dark basal zone. Diam. 3·75 mill.

Andaman Is., Mergui, Hong Kong.

R. TEMPLIANA, Nevill., and vars. NIGROFASCIATA and SUBIMBRICATA, Nevill. (unfigured.) *Andaman Is.*

Subgenus PLESIOTROCHUS, Fischer, 1878.

R. SOUVERBIANUS, Fischer. Pl. 50, figs. 44–46.

Perforate, spirally striate, rather indistinctly longitudinally ribbed, ribs low and wide, rounded, undulating the peripheral carina; aperture produced below into a short, narrow canal; yellowish white, with thread-like spiral purplish lines interrupted by the ribs and generally arranged in pairs, a purple articulated line at the suture and periphery, another on the base. Length, 7 mill.

Lifou, Loyalty Is.

Subgenus LIMNOTROCHUS, E. A. Smith, 1880.

R. THOMSONI, E. A. Smith. Pl. 50, figs. 47, 48.

Narrowly umbilicated, moderately solid; whorls 7, flattened, with a broad, deep furrow at the lower part, margined above by a keel, which is nodulous on the lower whorls, above this there are three granular spiral ridges, base with about eight ridges, and intervening finer concentric striæ; basal margin of aperture broadly sinuated, excurved and slightly effuse; livid purplish, dotted with brown, whitish at the suture and base. Length, 18 mill.

Lake Tanganyika, Africa (fresh water.)

R. KIRKI, E. A. Smith. Pl. 50, figs. 49, 50.

Narrowly umbilicated, dirty white; whorls 6 or 7, slightly concave, with arcuate, flexuous growth-lines, and 6 or 7 granular spiral

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liræ, that on the periphery strongest and duplicate, base with a nearly smooth band within the peripheral liræ, then with several granular liræ round the umbilicus. Diam. 18 mill.

Lake Tanganyika, Africa.

R. CYCLOSTOMA, and R. GIRAUDI, Bourg. (unfigured.)

Lake Tanganyika.

Genus LACUNA, Turton, 1827.

Section LACUNA (sensu stricto.)

L. PUTEOLUS, Turton. Pl. 50, figs. 51, 52.

Semiglobose, slightly expanded at the base, periphery obtusely angulated, rather solid, opaque, glossy; whitish, yellowish or reddish white, sometimes trifasciate, the middle band broadest; umbilicus narrow, deep. Length, 4 mill.

Northern Europe, France, Portugal.

L. auricularis, Mont., *L. fasciata*, J. Adams, *L. parva*, DaCosta, *Helix lacuna*, Mont., *L. rufa*, Dorset. Catal., *L. Montagui*, Turton, *L. expansa*, J. Adams, *L. pallidula*, Meyer & Möbius, *L. intermedia*, Locard, are all synonyms, besides the quasi-varietal names *conica*, *lactea*, *clausa*, *expansa*, etc., of Jeffreys.

L. PALLIDULA, DaCosta. Pl. 50, figs. 53, 53a, b, 54.

Widely umbilicated, largely, obliquely expanded, rather thin, opaque, glossy; under the epidermis are growth lines and a few spiral scratches; pale yellowish or olivaceous yellow; whorls 3, 4, rapidly increasing, the last disproportionately large, suture deeply impressed. Diam. 8–9 mill.

Northern Europe, Iceland, Greenland, Spitzbergen, New England.

L. neritoidea, Gould (fig. 54), *L. patula*, Thorpe, *L. Thorpeana*, Phil., and vars. *subtriangularis*, Kobelt, and *albescens*, Thorpe, are synonyms.

L. PORRECTA, Carpenter. Pl. 50, figs. 55, 56, 57.

Larger than *L. puteolus*, with more developed spire, body whorl slopingly expanded, effuse below, thinly spirally striate upon the thin olivaceous yellow or light brown epidermis, sometimes with a pale band under the obtusely angulated periphery.

Length, 13 mill.

Vancouver's Isl. to San Diego, Cal.

Var. EFFUSA, Carpenter. Fig. 56.

Larger, more effuse, whorls more tumid with well-impressed suture. Length, 17 mill.

Var. EXÆQUATA, Carpenter. Fig. 57.

Whorls flattened, suture scarcely impressed. Length, 12·5 mill.

Section EPHERIA, Leach, 1847.

L. VARIEGATA, Carp. Pl. 50, fig. 58.

Thin, expanded in front, periphery rounded or obtusely angulated, smooth, polished, fulvous, irregularly strigate with chestnut, with frequently a peripheral band of white spots, and sometimes another below the suture. Length, 7·5 mill.

Vancouver's Isl. to San Diego, Cal.

L. BOURGUIGNATI, Rochebrune. Pl. 50, figs. 59, 60.

Ventricose, subdistorted, thick, yellowish brown, spirally lirate, longitudinally striate by growth lines, umbilicated, lip rather thick. Length, 6 mill.

Cape Verd Is.

L. DIVARICATA, Fab. Pl. 50, figs. 61, 62, 64–73, 75.

Obliquely conical, periphery obtusely angulated, somewhat thin, translucent and glossy, with slight, numerous spiral striæ; white, yellowish or yellowish brown often with four brown bands of varying width, sometimes confluent into one band, and so disposed as to exhibit a white band just below the suture. Length, 11 mill.

Northern Europe, Iceland, Greenland, New England, N. W. Coast of North America.

It will be seen from the above synonymy that the species is circumpolar in distribution. The banding is most conspicuous on young specimens, but frequently it is entirely absent.

The synonyms include *L. bifasciata*, *L. cornea* and *L. striata*, Brown, *L. fusca*, Binney (fig. 64), *L. vincta*, Mtg. (figs. 67, 68), *L. solidula*, Lovén. (fig. 69), *L. labiosa* and *L. albella*, Lovén., *L. pertusa*, Conr., *L. borealis*, Phil. (fig. 75), *L. arctica*, Phil. (fig. 73), *L. gracilior*, Metcalfe (fig. 65), a narrow, elongated form, sometimes considered a variety, var. *ecanaliculata*, Jeffreys, *L. canalis*, Mont., *L. quadrifasciata*, Mont. (fig. 66), and the following forms from the West Coast of the United States: *L. compacta*, Carp., *L. carinata*, Gould (figs. 71, 72.)

L. UNIFASCIATA, Carp. Pl. 50, figs. 63, 74.

Small, glossy, generally with a colored keel, the band sometimes broken up into dots. Length, 4 mill.

California.

Var. AURANTIACA, Carp.

Orange-white, the band and keel obsolete.

Section MEDORIA (Leach), Gray, 1841.

L. CRASSIOR, Mtg. Pl. 50, fig. 76.

Stout, solid, opaque, epidermis light yellowish; whorls convex, a little tumid or round-shouldered above, epidermis thin, often gathered into obliquely longitudinal folds, under it the surface is minutely spirally striate; pillar lip flattened, expanded; imperforate. Length, 12·5 mill.

Northern Europe, Greenland, Sitka.

L. glacialis, Moller, and *L. pallida*, Donovan, are synonyms.

Section HALOCONCHA, Dall. 1886.

L. REFLEXA, Dall. Pl. 51, fig. 80.

Thin, light to dark chestnut brown, nearly smooth; whorls 2½–3, rapidly increasing, the last somewhat slantingly flattened above, inflated, suture distinct, umbilicus narrow.

Length, 10, diam. 13·8 mill.

Aleutian and Commander Is., Alaska.

L. ANTARCTICA, Martens. Pl. 51, figs. 81, 82; Pl. 46, fig. 34.

Thin, chitinous, rather widely, excavately umbilicated, thinly, subirregularly longitudinally striulate, with indistinct spiral lines, yellowish brown or chestnut color, umbilical region defined by a decided angle, and depression, interior chestnut color, with a pearly sheen. Diam. 6·8 mill.

South Georgia, Kerguelen Is.

L. pumilio, E. A. Smith (fig. 34), is probably the young of this species.

Section MEGALOMPHALUS, Brusina. 1871.

L. DEPRESSA, Seguenza. Pl. 51, fig. 83.

Minute, whorls rapidly enlarging, the last slantingly inflated, with microscopic, close-set longitudinal folds and intermediate spiral striæ, umbilicus wide, its wall flattened, aperture obliquely ovate. Length, 2 mill.

Algiers, Messina, Brindisi; 11–108 fms.

Supposed by Jeffreys to form a connecting link between Adeorbis and Fossarus.

L. AZONEA, Brusina (unfigured.) *Mediterranean Sea.*

L. Crosseana Kleciak, *L. Petitiana*, Tiberi, *L. mutabilis*, Costa, are synonyms.

L. EXCAVATA, Monts. (unfigured.) *Palermo.*

L. Monterosati, Granata, is a synonym.

Section STENOTIS, A. Ad., 1863.

L. LAXATA, A. Ad. Pl. 50, fig. 77.

Oval elongated, compressed, thin, whitish, spire small, pointed, whorls 3, flattened, rapidly increasing, the last one large, inflated, dilated in front, umbilicus large, open, defined by an angle.

Length, 2 mill.

Japan.

Section CITHNA, A. Adams, 1863.

L. TENELLA, Jeffreys. Pl. 51, figs. 84, 85.

Thin, semitransparent, glossy, without epidermis?, with a few irregular, microscopic, spiral lines on the body whorl, white, yellowish-brown at the apex, which is abruptly truncated; whorls 5, convex, gradually enlarging; aperture somewhat expanded and angulated at the base. Length, 3 mill.

N. of Hebrides Is., in 189 and 650 fms., *Mediterranean, Azores, Pernambuco, and E. of Japan;* 114–2050 fms.

Var. MARGARITIFERA, Watson. Fig. 85.

More or less strongly striated lengthwise, especially on the upper whorls.

Dr. Jeffreys thought this identical with and a synonym of his var. *costulata;* granting the identity, the Jeffreysian name should become the synonym, being latest published.

L. ADAMSI, Jeffreys. Pl. 51, fig. 86.

Thin, semitransparent, glossy, no sculpture except the umbilical ridge, white; whorls 4½, moderately convex, rapidly increasing, with deep suture; umbilicus narrow, enclosed by a sharp ridge.

Length, 1·5 mill.

Atlantic Ocean (Porcupine Exped.).

L. CARINATA, Jeffreys. Pl. 51, fig. 87.

Thin, opaque, glossy, biangulate, base with a few slight striæ, surface appearing closely granular under the microscope, white, yellowish brown towards the apex; whorls 5–6, flattened between the suture and upper keel, as well as between the two keels of the body whorl. Length, 2·5 mill.

Atlantic Ocean (Porcupine Exped.).

L. CINGULATA, Verrill. Pl. 51, fig. 93.

Rather solid, depressed, spirally striated, biangulated, white with a brown nucleus; whorls 3, rapidly increasing, flattened above and between the carinæ; umbilicus rather narrow and deep.

Length, 2·2, diam. 3·6 mill.

Off New England Coast; 906–1467 fms.

Resembles the preceding species, but is more depressed. Verrill observes that a young specimen, apparently of this species, has a distinct epidermis, bearing small hair-like processes, most prominent on the carinæ.

L. CINCTA, Jeffreys. Pl. 51, figs. 88, 89.

Thin, opaque, glossy, with a few spiral striæ, of which one below the suture is more prominent, and minutely tuberculated on the upper whorls, white; whorls 5, convex, with deep suture; outer lip thin, slightly expanding, folded over the pillar, inner lip attached to the pillar; umbilicus shallow, enclosed by a semicircular ridge and ending in a small, deep perforation. Length, 2·5 mill.

Atlantic Ocean (Porcupine Exped.)

L. NATICIFORMIS, Jeffreys. Pl. 51, figs. 90, 91.

Obtusely triangular, with excentric spire, thin, semitransparent and glossy, with a few rather strong basal striæ, besides the umbilical ridge, white; whorls 3, convex, rapidly increasing; umbilicus rather large, with a small, deep perforation.

Length, 1·75, diam. 2·75 mill.

Atlantic Ocean (Porcupine Exped.)

L. OLIVACEA, Verrill. Pl. 51, fig. 92.

Thin, translucent, with 4 convex whorls, the suture scarcely impressed, smooth, glossy, covered by a greenish yellow, thin, closely adherent epidermis; imperforate. Length, 4 mill.

Off Martha's Vineyard, Mass.

Probably not a member of the group, differing in having no excavated umbilicus, and in possessing an epidermis?.

Unfigured Species of Cithna.

L. PICTA, Watson. *Lat.* 9°, 5′, *S.*; *long.* 34°, 40′, *W.*
L. INFLATA, and L. GLABELLA, Monts. *Mediterranean.*
L. SPIRATA, and L. GLOBOSA, Adams. *Japan.*

Doubtful and Unfigured Species of Lacuna.

L. DECORATA, L. LATIFASCIATA, L. LEPIDULA, L. TURRITA, and L. INFLATA, A. Ad. *Japan.*
L. CARINIFERA, A. Ad. *Borneo.*
L. UNICARINATA, E. A. Smith. *Japan.*
L. (ERSILIA) MEDITERRANEA, Monts. *Mediterranean.*
L. SUCCINEA, Mörch. *West Coast of Central America.*
L. VESTITA, Dunker and Metzgar. *North Sea.*

L. PARVULA, Velain. Pl. 51, fig. 78.

Whorls angulated by spiral carinæ, of which there are three on the body whorl, fading towards the aperture; umbilicus narrowly rimate. Length, 1 mill.

Isl. St. Paul, Indian Ocean.

L. HEBERTI, Velain. Pl. 51, fig. 79.

Smooth, with three convex, rapidly increasing whorls, yellowish or brownish grey, umbilicus scarcely rimate. Length, 1·75 mill.

Isl. St. Paul, Indian Ocean.

This and the preceding species are of doubtful pertinence to the present group.

Family *FOSSARIDÆ.*

Genus FOSSARUS, Phil., 1841.

F. AMBIGUUS, Linn. Pl. 52, figs. 3–5.

Spirally striated, three of the striæ usually more prominent so as to cause the body whorl to appear angulated or carinated, epidermis light yellowish brown, aperture white. Length, 5 mill.

Mediterranean, Senegal.

The synonyms include *F. Adansoni*, Phil., *F. Lanoei*, Baudon, *F. lucullana*, Scacchi., *F. Sicula*, Aradas, *F. costatus*, Scacchi, *F. Kutschigi*, Brusina.

F. ELEGANS, Verrill & Smith. Pl. 51, fig. 96.

Spirally carinated, the last whorl with a carina at the shoulder, often with a smaller one just below it, a larger one again at the periphery, and three or four smaller ones below, besides a spiral fold round the umbilical region; there are also sometimes two or three strong raised varices, whorls latticed between the carinæ, white, umbilicus narrow, sometimes closed. Length, 5·3 mill.

Off Martha's Vineyard, Mass.; 100 fms.

This may prove to be a variety of *F. ambiguus.*

F. ORBIGNYI, Fischer. Pl. 52, fig. 6.

Umbilicated, white, rugose, with several distant spiral riblets, the interstices longitudinally striate; whorls 4, convex, with excavated suture. Length, 8, diam. 9 mill.

Cuba. Sta. Lucia, Jamaica.

Described by d'Orbigny as *F. sulcatus*, and changed as above on account of *F. sulcatus*, Wood.

F. MEDIOCRIS, Folin. Pl. 51, fig. 97.

Minute, imperforate, spirally ribbed, the sulci between the ribs longitudinally crenately striate; whorls 4, convex, with simple suture, chestnut colored. Length, 2·6 mill.

Bay of Panama.

F. LAMELLOSUS, Montrouz. Pl. 52, fig. 7.

Imperforate, solid, with acute spire and dilated base, with sharp, distant spiral ribs, of which there are four on the body whorl, the two upper ones strongest, interstices longitudinally lamellarly striate. Length, 6–8 mill.

New Caledonia.

F. PUSILLUS, Gould. Pl. 52, fig. 8.

Umbilicated, whitish, with minute spiral lines and three distant spiral ribs on the body whorl. Length, 4 mill.

Fishtown, Liberia.

Described as a Trichotropis.

F. ATRATUS, C. B. Ad. Pl. 52, fig. 10.

Minutely umbilicated, blackish, sometimes with a few white spots on the last whorl, and several revolving keels; the species variable in form and number of keels, conic when young, subglobular when mature. Length, 2 mill.

Panama.

Section PHASIANEMA, S. Wood. 1842.

F. RETICULATUS, S. Wood. Pl. 51, fig. 98.

Rather solid, semitransparent, lustreless, with numerous, sharp, distant longitudinal riblets crossed by more numerous, close spiral striæ, subimperforate; whorls 4, rather convex, the last inflated, light yellowish brown. Length, 1·5 mill.

Atlantic Ocean (Porcupine Exped.)

F. interjunctus, Jeffreys, Ms., is a synonym.

F. SULCATUS, S. Wood. Pl. 51, figs. 94, 95, 99, 100.

Spire elevated, whorls a little shouldered, the last large, with about six spiral riblets, the interstices clathrate, yellowish white; lip denticulated; umbilicus rather widely rimate. Length, 6 mill.

Mediterranean Sea.

It is *F. clathratus*, Phil., *F. costatus*, Brocchi., *F. minutus*, Mich. Two unfigured species from the Asiatic Seas, *F. tornatilis*, Gould, from Hong Kong, and *F. Japonicus*, A. Ad., from Japan, were considered by the latter author synonymous with *F. costatus*. To this Eastern synonymy must be added *F. Stoliczkanus*, Nevill (fig. 95.)

Unfigured and Doubtful Species.

F. GARRETTI, Pease (*Adeorbis costata*, Garrett). *Sandwich Is.*

F. GRANULUM, Brugnone. *Mediterranean Sea.*

Section ISAPIS, H. & A. Adams, 1854.

F. FENESTRATA, Carp. Pl. 52, fig. 11.

Umbilicated, spirally lirate, the liræ acute, distant, about 9 on the body whorl, the wider interstices with closer longitudinal sculpture; light yellowish brown, epidermis shaggy. Length, 5–6 mill.

Vancouver's Isl. to Lower California.

F. OBTUSA, Carp. Fig. 12.

Narrower, whorls less convex, less sharply costate than *F. fenestrata*; whorls flattened behind, ribs swollen, uneven.

Southern California.

I suspect that this will prove to be a mere variety of the preceding species.

Unfigured Species of Isapis.

F. ANOMALUS, C. B. Ad. *Jamaica.*
F. LIRATUS, and F. CONOIDEUS, A. Ad. *Japan.*
F. MACULOSUS, Carp. *Mazatlan.*
F. OVOIDEUS, Gould. *Mazatlan.*

Section COUTHOUYIA, A. Adams. 1860.

F. INSIGNIS, Nevill. Pl. 51, fig. 1; Pl. 52, fig. 13.

Widely umbilicated, whorls convex, the last subevolute, suture deeply channeled, surface spirally cingulated, elegantly reticulated by longitudinal lines. Length, 7 mill.

Singapore, Ceylon, Japan.

F. reticulatus, A. Ad. (fig. 13), is a synonym; it was first described, but the name is preoccupied by S. Wood.

Var. DELICATULA, Nevill.

Smaller, thinner, umbilicus smaller, spiral ribs one or two fewer.

Bombay.

Var. PERSOLUTA, Nevill.

Last whorl considerably less ventricose and more solute than in the typo.

Japan.

Unfigured Species of Couthouyia.

F. SUBRETICULATUS, Nevill. *India.*
F. SOLUTUS, and F. APPRESSUS, Nevill. *Persian Gulf.*
F. STYLIFERINUS, Nevill. *Singapore, Bombay.*
F. PLICIFERUS, F. STRIATULUS, and F. DECUSSATUS, A. Ad. *Japan.*

Section CONRADIA, A. Ad., 1860.

Unfigured Species.

F. DOLIARIS, A. Ad., and var. MINOR, Nevill.

Japan, Hong Kong, Bombay.

F. PULCHELLUS, F. TORNATUS, F. CINGULIFERUS, A. Ad. *Japan.*

F. ADAMSIANUS, Nevill. *Persian Gulf.*
F. CLATHRATUS, A. Ad. (*F. Adamsianus*, Fischer.) *Japan.*

Section GOTTOINA, A. Ad., 1863.

F. CEREUS, Watson. Pl. 51, fig. 2.

Rather solid, translucent, with a thin, polished, yellowish epidermis, imperforate; nearly smooth, with rather obsolete spiral threads, closer on the base; whorls 3, convex, rapidly increasing; columella a little truncate at the base, where the aperture is slightly produced.

Length, 5 mill.

N. E. Australia; 1400 fms.

F. SULCIFERUS, F. PYRGULA, A. Ad. (unfigured.) *Japan.*

Unfigured Species of Fossarus.

The following species, said to belong to the genus, have not been placed in either of its groups:

F. EXCAVATUS, F. ANGIOSTOMA, F. MEGASOMA, F. FOVEATUS, F. ABJECTUS, C. B. Ad. *Panama.*
F. ANGULATUS, F. TUBEROSUS, Carpenter. *Mazatlan.*
F. PARCIPICTUS, F. PURUS, Carpenter. *Cape St. Lucas, L. California.*
F. TASMANICUS, F. BULIMOIDES, Tenison Woods. *Tasmania.*
F. FENESTRATUS, A. Ad. *Japan.*
F. CUMINGII, A. Ad. *Hab. unknown.*
F. TROCHLEARIS, A. Ad. *Philippines.*
F. BICARINATUS, A. Ad. = *Separatista.*
F. MIRABILIS, Nevill. *Arakan.*
F. IMPERFORATUS, Nevill. *Penang.*
F. MULTICOSTATUS, Pease. *Sandwich Is.*

Subgenus RAULINIA, Mayer, 1864.

F. BADIA, Tenison Woods (unfigured.) *Tasmania.*

Subgenus IPHITUS, Jeffreys, 1883.

F. TUBERATUS, Jeffreys. Pl. 52, fig. 14.

Imperforate, solid, opaque, dull white, with a faint tinge of yellow, spirally ridged, the ridges tuberculate, base spirally striate, styliform process broken off; whorls 3, rapidly increasing, the last with

obtusely angulated periphery; outer lip undulated by the spiral sculpture. Length, 2 mill.

Atlantic Ocean (Porcupine Exped.)

F. TUBERCULATUS, Watson. Pl. 52, fig. 15.

Solid, glossy white; whorls 7½–8, flattened, slowly increasing, with spiral, stoutly tuberculated ribs, of which there are four on the body whorl, periphery angulated, lip varicose, continuous, interior margin double. Length, 1·75 mill.

Off Culebra Isl., West Indies; 390 fms.

The styliform apex consists of 3 whorls, the first two smooth, the last with a half dozen spiral threads.

Genus FOSSARINA, Ad. and Angas. 1863.

F. PETTERDI, Brazier. Pl. 52, figs. 20, 21.

Narrowly umbilicated, faintly spirally striate, with hardly visible longitudinal striæ, dark purplish black, with a few irregular white markings; whorls 3, convex, the last large and rounded, umbilical region white; interior greenish black, showing the external white markings. Operculum thin, many-whorled. Diam. 4·25 mill.

Hobart Town, Tasmania.

Hutton remarks that this species has the dentition and operculum of the Trochidæ but not of the Littorinidæ, and that it may possibly be an Adeorbis. *Proc. Linn. Soc., N. S. W.*, vii, 66.

It has not the pearly nacre of Trochus.

F. Simpsoni, Tenison Woods, is a synonym.

F. PICTA, A. Ad. Pl. 52, fig. 16.

Widely umbilicated, spirally lirate, yellowish, irregularly maculated with chestnut; whorls 4, convex, periphery rounded.

Diam. 3 mill.

Japan.

F. BRAZIERI, Angas. Pl. 52, fig. 17.

Narrowly umbilicated, rather solid, ash grey, maculated with purplish brown, irregularly spirally ridged, two of the ridges more prominent, like carinæ, longitudinally striated; whorls 3½, with well-impressed suture. Diam. 3·5 mill.

Port Jackson, Australia.

F. FUNICULATA, Tenison Woods. Pl. 52, figs. 18, 19.

Subumbilicated, solid, opaque, almost ear-shaped, with rounded alternately larger and smaller spiral ribs, more minute on the base;

whitish, with dark zigzag lines and spots; whorls 3½, the last much expanded. Diam. 5 mill.

Victoria, Australia.

F. PATULA, Adams & Angas. Pl. 51, fig. 2, a.

Widely umbilicated, with alternate larger and smaller tuberculated spiral ribs, ribs simple on the base, umbilicus acutely carinate-margined; whitish, sparsely maculated with dark brown; whorls 3, convex; outer lip ascending posteriorly. Length, 6 mill.

Port Jackson, Australia.

Appears to have the ornamentation, but not the form of the preceding species.

Unfigured Species.

F. VARIA (*Adeorbis*), Hutton. *New Zealand.*
F. LEGRANDI, Petterd. *Tasmania.*
F. VARIEGATA, A. Ad. *Eastern Seas.*

FAMILY *PLANAXIDÆ.*

Subfamily PLANAXINÆ.

Genus PLANAXIS, Lam., 1822.

P. SULCATUS, Born. Pl. 52, figs. 22–27, 31, 32.

Thick, spirally ribbed, with equal grooves, tessellated with white and chocolate color, sometimes becoming irregular longitudinal strigations, interior chocolate, ridges and columella white.

Length, 1 in.

Sandwich Is., Australia, Philippines, Mauritius, South Africa.

It is *P. buccinoides*, Desh., *P. Menkeanus*, Dunker, *P. pyramidalis*, Gmel., *P. undulatus*, Lam., and probably *P. obscurus*, A. Ad. (fig. 31.)

I think that *P. brevis*, Quoy. (fig. 32), is the young of this species; it is sparsely dotted with white.

Var. BREVICULUS, Desh. Fig. 24.

Shell shorter, more ventricose, grooves and ribs less strong.

Persian Gulf, Moluccas, New Guinea.

Nevill has described a var. *tessellata.*

Var. SAVIGNYI, Desh. Figs. 25–27.

Flat-ribbed, with narrower grooves, sometimes nearly obsolete, greyish brown, tessellated and undulated with chestnut, often with a lighter band at the periphery and another at the suture.

Red Sea, Persian Gulf.

P. grisea, Brocchi., *P. encaustica*, E. A. Smith (fig. 27), and var. *subnigra*, Nevill, are synonyms.

P. CRASSISPIRA, E. A. Smith. Pl. 52, fig. 28.

Distantly spirally grooved, grey, spotted and shortly strigate with chocolate. Length, 20 mill.

Hab. unknown.

Probably a very narrow form of *P. sulcatus.*

P. PLANICOSTATUS, Sowb. Pl. 52, fig. 30.

Dark chocolate color, with subequal alternate spiral ribs and grooves, lighter colored within. Length, 1 in.

San Blas, Panama, Galapagos Is.

It is *Bucc. planaxis*, Wood, *P. canaliculatus*, Duval, *P. circinata*, Lesson.

P. SUTURALIS, Smith. Pl. 52, fig. 33.

Yellowish white, spirally deeply grooved, with intermediate flat ribs. Length, 6 mill.

Chinese Seas.

P. NUCLEUS, Lam. Pl. 52, fig. 36.

Chocolate color, epidermis shortly velvety, flat ribbed and spirally grooved, but the sculpture obsolete except close to the aperture at the suture and on the base, the outer lip being fimbriated by it, interior chocolate. Length, 15–18 mill.

West Indies.

P. semisulcatus, Sowb., is a synonym.

P. ABBREVIATUS, Pease. Pl. 52, fig. 40.

Shorter than the next species, and without the expanded lip of *P. nucleus*, blackish chocolate, with closely-engraved striæ, obsolete except at the base. Length, 7·5 mill.

Tahiti.

P. NIGRA, Quoy. Pl. 52, figs. 37, 39, 41–47.

Epidermis chocolate or olivaceous chocolate, smooth, a few close, narrow, engraved lines at the base, and occasionally vestiges of others on the spire and at the suture, interior polished chocolate.

Length, 13–15 mill.

New Ireland, Viti and Sandwich Is., South Africa.

P. Hanleyi, Smith (fig. 39), *P. similis*, Smith (fig. 44), and *P. acutus*, Krauss (fig. 42), are synonyms. *P. Albersi*, Dunker (fig. 46), from Guinea, West Africa, may be identical, or it may be the young of *P. nucleus;* and probably *P. atropurpureus*, Recluz (fig. 45), from the "South Seas," may be added.

Var. NIGRITELLA, Forbes. Pl. 52, figs. 47, 43.

Dark chestnut or chocolate color, polished, under a thin epidermis, closely, narrowly spirally engraved, usually obsolete on the middle of the body whorl. Length, 12–15 mill.

It is somewhat difficult to distinguish this variety from the type, except by its distribution; it is usually lighter colored and occurs at Mazatlan, West Coast of Mexico.

P. acutus and *P. obsoletus*, Menke, are synonyms, and very probably *P. castaneus*, Smith (fig. 43), is to be added; it is described without locality.

P. LINEATUS, Da Costa. Pl. 53, figs. 49–57, 59, 63–66; Pl. 52, figs. 38–48.

Small, nearly smooth, polished beneath the epidermis, light yellowish varying to orange brown and chestnut color, spirally lineated with chestnut and chocolate. Length, 6–12 mill.

West Indies, Madeira, Paumotus, Tahiti, Solomon's Is., etc.

The lineations are usually regular throughout, but sometimes few and distant, at others the upper or lower part of the body whorl is devoid of them. First described in error as British.

The synonyms are *Bucc. zebra*, Megerle, *B. strigosum*, Gmel., *P. pedicularis*, Lam., *Bucc. pygmæum*, Brug., *P. succinctus*, A. Ad. (fig. 65), *P. eboreus*, Smith (fig. 64.) There can be no doubt of the specific identity of the Polynesian representatives which have received the names of *P. lineolatus*, Gould (fig. 57), and its var. *productus*, Nevill, *P. fasciatus*, Pease (fig. 66), *P. atra*, Pease (fig. 38), named from specimens so dark in color that the banding is scarcely visible except by transmitted light, *P. cingulatus*, A. Ad. (fig. 48), *P. variabilis*, E. A. Smith (figs. 50, 51), *P. ineptus*, Gould (fig. 52),

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and its variety *persulcata*, Nevill, *P. virgatus*, Smith (fig. 49), *P. zonatus*, A. Ad. (fig. 53), *P. longispira*, Smith (fig. 55), *P. strigatus*, Hanley (fig. 59), and *P. Hermannseni*, Dunker (fig. 54.)

Var. LABIOSUS, A. Adams. Fig. 41–56.

Shell larger and stouter, frequently covered by a persistent shortly pilose epidermis, upon which the darker bands of the shell are somewhat elevated.

Polynesia.

P. striatula, Phil. (fig. 56), *P. vestitus*, Dkr., *P. plumbeus*, Pease *P. pediculus*, Krauss, *P. Bronni*, Dunker are synonyms.

This catalogue of synonyms may appear to some to be a ruthless slaughter of species. I can only say that the admirable collection before me fully justifies me.

P. PUNCTOSTRIATUS, E. A. Smith. Pl. 53, figs. 60, 61.

Whorls convex, with very minute punctured spiral striæ, pale fulvous, ornamented with spiral rows of small square chestnut spots; margin of outer lip spotted. Length, 6·5 mill.

Hab. unknown.

P. TENUIS, E. A. Smith. Pl. 53, fig. 58.

Thin, elongated, polished, semipellucid, white, with a few distant, spiral, red lines, lightly spirally grooved, body whorl strongly grooved and ventricose below; outer lip thin. Length, 5·5 mill.

Hab unknown.

Very probably a variation of *P. lineata*, DaCosta.

Section HINEA, Gray, 1847.

P. MOLLIS, Sowb. Pl. 52, figs. 34, 35, 29.

Whitish under a yellowish brown, minutely pilose epidermis, sometimes with a darker peripheral band, smooth, with several engraved lines near the base, aperture yellowish white.

Length, 20–25 mill.

Easter Island, Australia, Nicobar Is.

First described by Lamarck under the name of *P. Brasiliensis*, a misnomer. Other synonyms are *P. pigra*, Forbes, *Bucc. lævigatum*, Wood, *P. fulva*, A. Ad. I think that *P. Nicobaricus*, Zelebor (fig. 29), will prove to be at most a slight variety.

Subgenus QUADRASIA, Crosse, 1886.

P. HIDALGOI, Crosse. Pl. 53, figs. 67, 68.

Imperforate, solid, dull, orange brown, minutely spirally striulate, suture margined, outer lip simple, not dentate within.

Length, 13 mill.

(Fluviatile) *Philippines.*

This appears to be an undoubted inhabitant of fresh water, and as such is an interesting novelty; but are not its affinities with Melanopsis rather than with Planaxis?

Subgenus QUOYIA, Desh., 1830.

P. DECOLLATUS, Quoy. Pl. 53, figs. 71, 70.

Strongly spirally grooved, grooves stronger on the base; columellar lip excised above; epidermis olivaceous, with dull chestnut obliquely longitudinal strigations; apex decollated.

Length, 28 mill.

Philippines, Ascension Isl., New Guinea.

It is *Monoptygma melanoides*, Lea, and *P. Michaui*, Crosse and Fischer (fig. 70.) The latter is founded on a younger specimen, in which a chestnut peripheral band appears, and the interior of the outer lip is not ridged; both these characters merge into the normal type of the species with increasing age.

Subgenus HOLCOSTOMA, H. & A. Ad., 1853.

P. PILIGERUS, Phil. Pl. 53, figs. 62, 69.

Smooth, under a bristly epidermis, yellowish brown, with two chestnut bands, outer lip dentate within. Length, 8 mill.

Mauritius.

The first figure is from an adult denuded of epidermal hairs, the second represents *H. setigerum*, A. Ad. (fig. 69), which is said by Mr. E. A. Smith, of the British Museum, to be identical; if so, it must be a much-magnified figure of a young shell which has not yet acquired the teeth to the outer lip.

Unfigured Species of Planaxis.

P. INCISUS and P. TÆNIATUS, Phil.	*Hab. unknown.*
P. NUCLEOLA, Mörch.	*West Indies.*
P. BUCCINEA, A. Ad.	*West Indies.*
P. GOULDI, Smith (*P. cingulatus*, Gld., not Ads.)	*Japan.*
P. AREOLATUS, Lesson.	*Tahiti.*
P. SEMILÆVIS, Martens.	*Socotra.*
P. EBENINUS, Menke.	*Peru.*

Subfamily LITIOPINÆ.

Genus LITIOPA, Rang., 1829.

L. MELANOSTOMA, Rang. Pl. 53, figs. 72–75, 78.

Whorls about 9, slightly convex, towards the apex microscopically longitudinally costulate, other whorls very finely spirally stri-

ate; light yellowish brown, outer lip often bordered internally with black. Length, 6 mill.

Pelagic, universally distributed in warm seas, on floating seaweed.

The synonymy includes *L. striata*, Pfr., *Buccinum litiopa*, Mrs. Gray, *L. bombyx*, Rang. (fig. 74), *L. maculata*, d'Orb., *L. divisa*, Carp., *L. nitidula*, Pfr. (fig. 73), *L. decussata*, Gould (fig. 78), and *L. Grateloupiana*, Drouet. (fig. 75.)

L. SAVIGNYI, Issel. Pl. 53, fig. 76.

Smooth, translucent, whitish or yellowish, with numerous small opaque white spots; whorls 7, suture impressly margined; columella subtruncate. Length, 3 mill.

Suez.

The figure has the aperture of a Diala, but Issel describes the columella as above.

L. JEFFREYSIANA, Issel. Pl. 53, fig. 77.

Whitish, subpellucid, shining, smooth; whorls 9–10, the last subangulate above and below; columella straight, subtruncate at the base. Length, 2 mill.

Red Sea.

Possibly synonymous with *L. melanostoma*.

L. BELANGERI, Eyd. et Soul. Pl. 53, fig. 79.

Longitudinally costate towards the apex, very finely spirally striate elsewhere, reddish brown, with darker spiral bands; columella not truncate below. Length, 6 mill.

China Sea.

Unfigured Species.

L. VENTROSA, A. Ad., and var. MINOR, Nevill. *Indian Ocean.*
L. EFFUSA, and L. OBESA, C. B. Ad. *Jamaica.*
L. VENTROSA and L. CARINATA, Pfr. *Cuba.*

Subgenus ALABA, A. Ad., 1862.

All the species of the typical group (most of them by Arthur Adams), remain unfigured, and I have no reliably determined specimens from which to represent the types.

Unfigured and Undetermined Species.

L. TERVARICOSA, L. MELANURA, C. B. Ad. *Jamaica.*

Cingula præusta, Recluz is said to be a synonym of the last-named species.

L. SUPRALIRATA, L. VIOLACEA, L. TEREBRALIS, L. ALABASTRITES, L. CONICA, L. SCALATA, L. MUTANS, Carp. *Mazatlan.*

L. PICTA, L. LEUCOSTICTA, L. CORNEA, L. ZEBRINA, L. IMBRICATA, L. FELINA, L. LUCIDA, L. INFLATA, and L. SUBANGULATA, A. Ad. *Japan.*

L. VIBEX, L. PULCHRA, L. PAGODULA, A. Ad. *Australia.*

L. BLANFORDI, A. Ad. *Siam.*

L. PUNCTOSTRIATA, Gould. *Loo Choo Is.*

L. SENEGALENSIS, Maltzan. *Senegal.*

L. RECTANGULA, Craven. *Ceylon.*

L. WOOD-MASONIANA, Nevill. *Andaman Is.*

L. DORIÆ, Issel. *Suez.*

L. St. CLARÆ, Tenison Woods. *Tasmania.*

Subgenus DIALA, A. Ad., 1862.

L. SEMISTRIATA, Phil. Pl. 53, fig. 81.

Thin, reddish brown, variegated with a lighter shade; whorls 7, flattened, the last with subangulated periphery, spirally ribbed and sulcate below it. Length, 4·5 mill.

Mauritius, Japan, Hong Kong, Bombay, Suez, etc.

It is *L. macula* (Recluz), Nevill, and *L. varia*, A. Ad.

L. INCERTA, d'Orbigny. Pl. 70, fig. 64a.

This species, which I placed among the unfigured Eulimidæ in vol. viii, 278, was figured in the Moll. Cuba. I now add illustration and description.

Shell smooth, polished, whitish, with spiral white maculations; whorls 8, the last a little angulated, striated below.

Length, 3 mill.

Cuba.

L. MARTENSI, Issel. Pl. 53, fig. 82.

Shining, closely spirally striated; whorls 7½, subplanulate, with deep suture, last whorl with obtusely angulated periphery, and spirally sulcate below it. Length, 2·25 mill.

Red Sea (subfossil.)

L. LAUTA, A. Ad. Pl. 53, fig. 83.

Whitish, with spiral interrupted brown lines; whorls 7, flattened, spirally sulcate, periphery subangulate, sulci stronger on the base. Length, 6–7 mill.

Port Adelaide, South Australia.

L. punctata, Tenison Woods, is a synonym.

L. PHASIANELLA, Angas. Pl. 53, fig. 84.

Thin, semipellucid, smooth, whitish, encircled by several thread-like, more or less interrupted chestnut lines, with a band of alternate white and chestnut spots above the suture, and a few short longitudinal flames beneath them. Length, 6 mill.

Port Jackson, Australia.

The original description gives the whorls as nearly flat, but in the figure they are moderately rounded.

L. ALBUGO, Watson. Pl. 53, fig. 88.

Spirally striated, fulvous, spotted with white in spiral lines, and irregular broad longitudinal strigations, and forming irregular white bands at the top of the whorls and angulated periphery; whorls 6, flattened. Length, 3·3 mill.

Wednesday Isl., N. E. Australia.

L. SUTURALIS, A. Ad. Pl. 53, fig. 85.

Subumbilicated, white, shining, subdiaphanous; whorls 7, flattened, with channeled suture, spirally sulcate, last whorl subsolute, with subangulated periphery, and narrow bands articulated with white; columellar lip obsoletely plicate. Length, 9 mill.

Philippines.

L. LEITHI, E. A. Smith. Pl. 53, fig. 86.

Imperforate, thin, yellowish, with narrow chestnut bands, two in the last whorl; whorls 9, convex, spirally striate, the last whorl obtusely angulated. Length, 7·5 mill.

California.

In error the figure accompanying the original description is labelled *Carinifex Ponsonbyi*.

L. MARMOREA, Carp. Pl. 53, fig. 87.

Solid, glossy, whitish, with faint chestnut longitudinal strigations; whorls flattened, periphery faintly angulated. Length, 5 mill.

Monterey, Cal.

L. LIMNÆIFORMIS, Watson. Pl. 53, fig. 89.

Scarcely rimate, thin, smooth, whitish horny; whorls 3½, rapidly increasing, suture deep; columella subtruncate. Length, 2·25 mill.

Prince Edward's Isl.

Unfigured and Undetermined Species of Diala.

L. MONILE, A. Ad. (*L. tessellata*, Tenison Woods, a syn.)

Australia.

L. TUMIDA, Tenison Woods. *Tasmania.*

L. ACUTA, and L. ELECTRINA, Carp. *California, Lower California.*
L. PAUPERCULA, C. B. Ad. (*L. mammillata*, Carp.)
Panama, Mazatlan.
L. SUCCINCTA, A. Ad. *Suez.*
L. SULCIFERA, A. Ad. *Japan.*
L. RUFILABRIS, A. Ad. (Is a Hydrobia.) *Australia.*
L. TENUIS and L. SIMPLEX, E. A. Smith. *Japan.*

Subgenus STYLIFERINA, A. Ad., 1860.

See Monograph of Eulimidæ, Manual, viii, 286.

The following additional species are published in the Report of the Challenger Expedition, in which work the group is referred to Litiopidæ.

L. STRIATA, Watson. Pl. 53, fig. 80.

Spirally striated and longitudinally ribbed, the intersections nodulous, style short, cylindrical, whorls convex, suture impressed; whorls 5, besides 3 smooth whorls of the style; columella a little truncate below. Length, 2·5 mill.

Tahiti.

L. FULVA, Watson. Pl. 53, fig. 90.

Fulvous, narrowly, distantly longitudinally ribbed, more closely spirally striate; apical whorls 2, smooth, the others 10, convex, periphery slightly angulate; columella obliquely, slightly truncate. Length, 3·3 mill.

Cape York, N. E. Australia.

L. SULCATA, Watson. Pl. 53, fig. 91.

White, spirally striated, the striæ obsolete on the middle of the body whorl; apex scarcely styliform, normal whorls 5, convex. Length, 1·75 mill.

Cape York, N. E. Australia.

The appearance of a canal in the figure is caused by a portion of the base of the aperture being broken off. Watson remarks that it may be the young shell of some other genus.

L. GONIOCHEILA, A. Ad. Pl. 53, fig. 92.

Thin, vitreous, pellucid, with a single spiral series of milk-white maculations on the middle; whorls 9, somewhat convex, suture margined. Length, 5 mill.

Japan.

This was included among the unfigured species of Eulimidæ, in Manual, viii, 286. I am now able to add a figure from the Challenger Report.

L. LEPIDA, A. Ad. (unfigured.) *Japan.*

Family *GIRAUDIDÆ.*

Genus GIRAUDIA, Bourg., 1885.

G. PRÆCLARA, G. GRANDIDIERIANA, Bourg. (unfigured.)
Lake Tanganyika.

Genus REYMONDIA, Bourg., 1885.

R. HOREI, Smith. Pl. 70, fig. 64b.

Smooth, chestnut colored, with a white line beneath the suture; whorls 6½, scarcely convex, suture simple, last whorl rising somewhat upon the preceding near the aperture, then suddenly descending, furnished with a slight basal thickening; lip a little thickened, especially towards the suture, somewhat patulous near the base.

Length, 14 mill.

Lake Tanganyika.

Described as a doubtful Melanian. From the figure, it appears to me to be not very distantly related to Melanopsis.

R. GIRAUDI, Bourg. (unfigured.) *Lake Tanganyika.*

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Monograph of the Families Rissoiidæ, Jeffreysiidæ, Skeneidæ, Choristidæ and Homalogyridæ.

Family *RISSOIIDÆ.*

Animal with a more or less elongated muzzle; elongated, cylindrical tentacles, with the eyes on swellings at their outer bases; verge (male organ) exserted, situated at a considerable distance behind the right tentacle; gills both pallial, the right one largest, rather short and broad, composed of few laminæ, which are much broader than high; foot oblong, punctate before, rounded or pointed behind; operculigerous lobe well developed. Operculum corneous, paucispiral. Dentition (Pl. 54, fig. 98.)

Shell small, usually turbinate or elongate, often more or less umbilicated; peristome continuous, more or less rounded, never truly channeled in front.

The Rissoiidæ are small, often minute, phytophagous marine mollusks, inhabiting all parts of the world, frequenting algæ, zostera, etc., from which they often suspend themselves by a mucous filament.

Formerly a large number of fresh and brackish-water forms were here included, which, although nearly allied both as to animal and shell, are now perhaps more properly considered to form a family apart—Hydrobiidæ: these will be considered in the series of the Manual devoted to Fresh Water Mollusks.

The Rissoiidæ have been monographed by: Schwartz von Mohrenstern, Denkschriften K. Akad. Wissen, 1860–64.

Sowerby, in Reeve's Conchologia Iconica, xx, 123, sp. No date.

Weinkauff, in Küster's Conch. Cab., 273 species, 1876.

Synopsis of Genera and Subordinate Groups.

Genus RISSOIA, Frémenville. 1814.

Shell imperforate or subperforate, more or less oblong, turbinated, usually thick, white or corneous, smooth, ribbed or cancellated, aperture entire, oval, peristome thick, simple or reflected. Operculum corneous, paucispiral (Pl. 54, fig. 95).

The animal has long, slender tentacles, sometimes ciliated, with eyes on small prominences near their outer bases; mantle with a tentacular appendage in front, on the right side, or on either side; foot truncate in front, attenuated behind, with a glandular sulcus

on its lower side; operculigerous lobe with a wing-like expansion on either side, with one to three posterior filaments. Jaws oval, lingual teeth 2-1-1-1-2 (Pl. 54, fig. 98).

Fully 200 recognized species have been made known to science, besides unfigured species and synonyms amounting to perhaps 400 more. From their minute size it is probable that many more remain to be described. They inhabit all seas, from high water to 100 fathoms, but being phytophagous, abound most in shallow water, near shore, on beds of seaweed.

There are a few secondary species, but Rissoia is principally found fossil in tertiary beds.

Rissoia is active and bold, floats like its congeners, and spins a byssal thread instantly upon being detached from its foothold. The incessant play of the tentacular ciliæ is very striking. The pallial filaments probably are, like the tentacles, tactile in function.

Subgenus RISSOIA (sensu stricto).

Shell elongated conic, longitudinally costate; aperture oblong, with a thickened peristome bearing an exterior rib.

R. VENTRICOSA, Desmarest.

The characters of the following subordinate groups so merge one into another that in many cases the relegation of species to a particular division is an entirely arbitrary matter. I shall indicate the sections; but it must be understood that many of the species have not been assigned heretofore to any section, and that others belong to two or more sections, according to the variation of their characters. No doubt the institution of divisions founded upon such unsubstantial characters has tended to the undue multiplication of species; but I am unable to satisfactorily arrange the synonymy—this can only be done by one who will devote himself to the subject, as a specialty.

Section APICULARIA, Monterosato. 1884.

Shell turbinate, whorls and aperture more rounded, the interstices of the rounded ribs spirally striate. R. EHRENBERGI, Phil.

Section RISSOSTOMIA, Sars. 1878.

Shell very thin, smooth or slightly longitudinally costate, often with zigzag longitudinal fulvous markings.

R. MEMBRANACEA, Adams.

Section PERSEPHONA (Leach, 1852), Monts 1884.

Originally included a heterogeneous assemblage of species of various types. Monterosato has recently restricted it to those having punctate spiral lines; either longitudinally ribbed or smooth. R. RUFILABRIS, Leach.

This group shades unmistakably into the typical one.

Section SCHWARTZIA, Bucq. Dautz. et Dollf. 1884.

Shell elongated, conic, longitudinally ribbed or smooth, columella dentate. R. MONODONTA, Bivona.

Section ZIPPORA, Leach. 1847.

Clausilia-like, generally elate, smoothish or longitudinally ribbed; margin of aperture dilated or reflected.

Acme, H. & A. Adams, is a synonym. R. AURISCALPIUM, Linn.

Section TURBELLA, Leach. 1847.

Shell ovate, minute, often flamed or maculate with chestnut, with rounded longitudinal ribs, becoming obsolete on lower part of body whorl, or sometimes smooth, no spiral striæ. R. PARVA, DaCosta.

Pusillina, Monts., 1884, may be united with this section. Whorls turriculated, ribs interrupted, lip acute, not externally varicose. *R. pusilla*, Phil.

? Section MOHRENSTERNIA, Stoliczka. 1868.

Turriculated, thin, semipellucid; whorls frequently transversely costulate; columella fissured at the base; aperture subovate, angulated behind, rounded in front, margin very little dilated, outer lip simple, scarcely varicose. Fossil in brackish or fresh-water deposits, R. INFLATA, Andrzejowski. *Eastern Europe.*

Section MANZONIA, Brusina. 1870.

Shell more or less shouldered, longitudinally ribbed, spirally ridged, peristome duplicate. *European.* R. COSTATA, Ads.

Flemingia, Jeffreys, 1884, is a synonym.

Section FOLINIA, Crosse. 1868.

Turriculated, longitudinally ribbed, spirally striate, posterior end of aperture with a small sinus. R. INSIGNIS, Folin. *Panama.*

Subgenus SABANÆA, Leach. 1847.

Shell smooth, stout, elevated conic, peristome thick, continuous. R. FLAMMEA, Frauenf.

Section CORENA, A. Adams. 1870.

Elately turbinate, with obtuse apex, rimate; aperture circular, peristome duplicate, continuous, outer lip externally reflected, inner lip with thin, callous expansion and posterior tubercle.

R. TUBERCULIFERA, A. Ad. *Gulf of Suez.*

Section AMPHITHALAMUS, Carpenter. 1865.

Shell smooth, pupoidal, with large nucleus; peristome duplicated, the inner lip produced forward, with a subbasal space behind it, outer lip joining it posteriorily, suddenly contracted in the adult. *California, Australia, Japan.* R. INCLUSA, Carp.

Scrobs, Watson, 1886, is a synonym.

Section NODULUS, Monts. 1878.

Shell subcylindrical, with obtuse spire, whorls smooth or feebly spirally striate; aperture rounded, peristome thick, continuous.

R. CONTORTA, Jeffreys.

Peringiella and *Pisinna*, Monts, 1878, may be united with this group.

Section ANABATHRON, Frauenfeld. 1867.

Shell scalariform, with a carinated shoulder, imperforate, smooth; aperture rounded, peristome continuous. R. CONTABULATA, Frauenf.

Section PELECYDIUM, Fischer. 1872.

Imperforate, elongate, subarcuated, finely striate; whorls somewhat flattened, apex mamillate; last whorl small, descending, deviating; aperture semicircular, exserted, entire, peristome continuous, somewhat thickened. R. VENUSTULA, Fischer.

Section HEMISTOMIA, Crosse, 1872.

Imperforate, elongated, thin, smooth, olivaceous corneous, under a persistent thin epidermis, apex mamillate, obtuse; aperture a little solute, peristome continuous.

New Caledonia. R. CALEDONICA, Crosse.

The characters of this group correspond mainly with those of the preceding one, but the corneous texture and brackish water habitat, have led Dr. Fischer to place it in the Hydrobiidæ. If it should prove identical with Pelecydium, the latter name will become a synonym. The operculum of Hemistomia is unknown.

Subgenus CINGULA, Fleming. 1828.

Shell thin, smooth or spirally striated, spotted or banded near the suture, outer lip sharp, or slightly thickened.

R. CINGILLUS, Montg.

Cingilla, Monts. 1884, is a synonym.

Section CINGULA (restricted.)

Shell elongated, with subacute spire, whorls flatly convex.

Section ONOBA, H. & A. Adams. 1854.

Turbiniform or somewhat elongated, whorls convex, conspicuously spirally striated, sometimes with short longitudinal plicæ at the suture; aperture oval, peristome continuous, thin or slightly thickened. R. STRIATA, Mtg.

Section CERATIA, H. & A. Adams. 1854.

Subcylindrical, thin, whorls flatly convex, with obtuse apex; outer lip thin and sharp.

Animal with flattened, mostly short and claviform tentacles, foot bifurcate behind. R. PROXIMA, Alder.

Section HYALA, H. & A. Adams. 1854.

Shell elevated conic, thin, hyaline, smooth or spirally striate; aperture oval, slightly emarginate anteriorily, outer lip thin, simple. Operculum subspiral.

Tentacles with setaceous summits. R. VITREA, Forbes & Hanley.

Section PLAGIOSTYLA, Fischer. 1872.

Smooth, transparent, apex papillary, last whorl descending; aperture semilunar, pillar lip oblique, rectilinear, outer lip not varicose.

R. ASTURIANA, Fischer.

Section SETIA, H. & A. Adams. 1854.

Whorls few, smooth, ventricose, spotted, spire short, with obtuse apex, aperture suborbicular. Animal with pilose tentacles.

R. PULCHERRIMA, Jeffreys.

Subsection MICROSETIA, Monts. 1884.

Imperforate or rimate, minute, brightly colored, often fasciate, smooth.

Pseudosetia, Monts. is a synonym. R. TURGIDA, Phil

Subsection CINGULINA, Monts. 1884.

Obtuse or globular, unicolored, lip thickened, covering the umbilicus. R. ALDERI, Jeffreys.

Subsection PARVISETIA, Monts. 1884.

Imperforate, spire rather short, apex obtuse, aperture expanded, semilunar, lip thickened. R. SCILLÆ, Seguenza.

Subgenus RISSOPSIS, Garrett. 1873.

Thin, elongated, cylindrical, apex truncate; aperture subovate, angular above, entire, peristome rather thin, somewhat expanded, columella oblique, arched. R. TYPICA, Garrett.

Subgenus ALVANIA, Risso. 1826.

Shell oval, turbiniform, spire short, with sharp apex, whorls rounded, nodulously cancellated, aperture subcircular, crenulated or grooved within, outer lip margined exteriorly by a varix.

Acinus, Monts, 1884, is a synonym. R. CIMEX, Linn.

Section ACINOPSIS, Monterosato. 1884.

Aperture subcanaliculate anteriorily, columella tuberculate below. R. CANCELLATA, DaCosta.

Section NEVILLIA, A. Adams. 1868.

Imperforate, acutely ovate, whorls convex, spirally lirate, longitudinally striate; columella callous, toothed below, outer lip smooth or toothed within, varicose exteriorly. R. PICTA, A. Ad.

Section ALVINIA, Monts. 1884.

Whorls shouldered, spiral sculpture stronger than the longitudinal ribs. R. WEINKAUFFI, Schwartz.

Galeodina, Monts. 1884 (*R. carinata*, DaCosta), is a synonym.

Section THAPSIELLA, Fischer. 1884.

Elongated conic, whorls flatly convex, cancellated by close, small riblets and spiral lines, lip thin. R. RUDIS, Phil.

It is *Thapsia*, Monts. 1884, not Albers. 1860.

Section MASSOTIA, Bucq. Dautz. et Dollf., 1884.

Shortly oval, last whorl swollen, aperture large, surface feebly reticulated. R. LACTEA, Michaud.

Section ACTONIA, Monts. 1884.

Lip inferiorly, obliquely expanded, externally thickened; turbinately elongated, decussed by close riblets and spiral striæ.

R. ABYSSICOLA, Forbes.

Genus RISSOINA, d'Orbigny. 1840.

Rissoiform, ribbed or cancellated, whorls numerous, apex mamillated; aperture semilunar, lip thickened within, a little reflected,

anteriorly effuse or faintly channeled. Operculum corneous, thick, semilunar, paucispiral, with a claviform process on the internal face. (Pl. 54, figs. 93, 94.)

The form of the operculum, and effuse character of the base of the aperture are distinguishing features of this group. The species inhabit warm and temperate seas, are world-wide in distribution, and over 100 good species have been characterized. There are some secondary and tertiary species.

Section RISSOINA (typical).

Longitudinally costate, with or without spiral striæ, aperture produced below, without funicular rib on the base. R. INCA, Orb.

Section RISSOLINA, Gould. 1861.

With funicular rib below. R. ELEGANTISSIMA, Orb.

Section MICROSTELMA, A. Ads. 1863.

Turreted, ovate, rimate, spire conic, whorls longitudinally plicate; aperture oblong, produced anteriorly, subcanaliculate, inner lip thickened, outer lip simple. R. DÆDALA, A. Ad. *Japan.*

Section SCHWARTZIELLA, Nevill. 1884.

Aperture without basal emargination. R. BRYEREA, Mtg.

Section PHOSINELLA, Mörch. 1876.

Shell reticulated by subequal sculpture; aperture profoundly sinuated below. Operculum denticulate posteriorily.

R. SAGRAIANA, d'Orb.

Section ZEBINELLA, Mörch. 1876.

Shell very finely longitudinally costellate and spirally striate; aperture widened and emarginate below. R. RETICULATA, Sowb.

Section MORCHIELLA, Nevill. 1884.

Upper part of shell longitudinally ribbed, lower part smooth, or spirally striate. R. GIGANTEA, Desh.

Section ZEBINA, H. & A. Adams. 1854.

Shell white, solid, opaque, polished, smooth or partly striate; outer lip rather thick, often with one or more anterior internal tubercles. R. BROWNIANA, d'Orb.

Section PYRAMIDELLOIDES, Nevill. 1884.

Narrowly turreted, with spiral ribs, tuberculated below the suture.

R. INSOLITA, Desh.

Section STOSSICHIA, Brusina. 1879.

Embryonal shell sinistral; whorls cancellated; aperture canaliculated in front, lip varicose, dentate within, axis subperforate.

R. MIRABILIS, Dunker; R. PLANAXOIDES, Desm. Miocene of *Aquitaine.*

The group was proposed first for fossil species, but the above recent shell, referred by Semper to a new group *Isselia* (preoccupied, and by Nevill to *Isseliella*, 1885, may be included.

Subgenus EATONIELLA, Dall. 1876.

Smooth, aperture subcircular, peristome simple, continuous, not effuse below, lip margin not thickened. Operculum paucispiral, with an interior claviform process. R. KERGUELENEUSIS, Smith. 3 sp. *Kerguelen Is.*

Name substituted for *Eatonia*, E. A. Smith, preoccupied.

Genus BARLEEIA, Clark. 1855.

Conically turbinated, whorls slightly convex, smooth; aperture oval, entire, rounded in front, lip sharp. Operculum subconcentric, not spiral, with lateral nucleus, and an internal rib-like processs.

Operculigerous lobe without processes, tentacles moderate, simple, obtuse at their extremity, foot a little emarginate behind, truncate in front. B. RUBRA, Adams. *Europe.*

Many conchologists place this group in connection with Jeffreysiidæ, rather than with Rissoiidæ.

Genus KEILOSTOMA, Desh. 1848.

Elongated, turriculate, usually spirally striate; aperture short, entire, twisted at the base, angular behind, lip very thick, exteriorly varicose, laterally produced, sinuous behind.

Cretaceous and Eocene; *Europe, India.* K. EXIMIA, Desh. (Struct. & Syst. Conch., t. 72, f. 39.)

On account of *Chilostoma*, Fitz., 1833, Bayan, in 1873, changed the above name to *Paryphostoma.*

Genus FAIRBANKIA, Blanford. 1868.

Shell imperforate, turreted, with a brown epidermis; aperture suboval, rounded in front, lip slightly dilated, with acute margin and exterior varix. Operculum corneous, subannular, with an interior long transverse rib.

Animal with long filiform tentacles, and eyes sessile at their bases; proboscis elongated; foot wide, sinuated in front, rounded behind. F. BOMBAYANA, Blanf. Estuary; *Bombay Harbor.*

Combines the epidermis, and to a great extent the animal of Hydrobia, with the peristome of Rissoia and the operculum of Jeffreysia.

Genus IRAVADIA, Blanford. 1867.

Rissoiform, the apex often obtuse, whorls spirally ribbed and covered with an epidermis; aperture ovate, margins continuous, anteriorly slightly effuse, outer lip with an external varix. Operculum and animal unknown.

Brackish water. *India.* I. ORNATA, Blanford.

Probably closely related to Fairbankia.

Genus FENELLA, A. Adams. 1871.

Shell turriculate, subulate, or pupoid, whorls cancellated; aperture oval in front, peristome interrupted, lip sharp, thickened or varicose. F. PUPOIDES, A. Ad. *Japan.*

Some authors place Fenella in Pyramidellidæ.

Genus PUTILLA, A. Ad. 1867.

Shell turbinated-conic, solid, smooth, rimate; aperture suborbicular, lip thickened, subeffuse in front, scarcely expanded. Relationships obscure. P. LUCIDA, A. Adams. *Japan.*

Genus SKENELLA, Pfeffer, 1886.

Shell depressed globose, compressed around the umbilicus; peristome continuous, the inner lip straight, oblique; operculum paucispiral, with a projecting lamina, arising from the nucleus.

S. GEORGIANA, Pfeffer.
South Georgia.

FAMILY *JEFFREYSIIDÆ.*

Proboscis bilobed in front, forming two sharp, narrow, ciliated appendages as long as the tentacles, which are equally ciliated; eyes sessile at the base of the tentacles; foot lanceolate. Jaws scaly (Pl. 54, fig. 2). Radula variable, short, the central tooth small, with slightly reflected margin, lateral tooth arcuate, sometimes denticulate, sometimes unarmed, marginal teeth absent or present (Pl. 54, fig. 1).

Shell small, thin, transparent, with oval aperture. Operculum imbricated, concentric, with marginal nucleus, the inner face with a transverse carina (Pl. 54, figs. 96, 97).

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Genus JEFFREYSIA, Alder. 1849.

Characters those of the family. Distr. *Europe, Japan.*

J. DIAPHANA, Alder.

Jeffreysia lives on algæ, from which it can suspend itself by a mucous thread. The eyes are visible through the shell.

Rissoella, Gray, 1847 (not described), is a synonym.

Subgenus TATEA, Tenison Woods. 1879.

Shell elongate pyramidal. Operculum calcareous, with a vertical, submarginal claw. Animal with truncate foot and long tentacles. T. HUONENSIS, Woods. *Tasmania.*

Subgenus DARDANIA, Hutton. 1882.

Shell ovate, subconical, smooth, imperforate, olivaceous; aperture oval, entire, rounded in front; peritreme not continuous, outer lip thin. Operculum like Jeffreysia. D. OLIVACEA, Hutton.

New Zealand.

FAMILY *SKENEIDÆ.*

Head large, proboscidiform, foot truncate in front, operculigerous lobe without appendages, tentacles long, cylindrical, eyes nearly sessile, at their external base (Pl. 54, fig. 100). Jaws tuberculate. Radula like Hydrobia (Pl. 54, fig. 99).

Shell depressed, nearly discoidal, few-whorled, widely umbilicated, aperture rounded, peristome continuous. Operculum corneous, multispiral.

Genus SKENEA, Fleming. 1828.

Characters those of the family. *Northern Seas.* Low water, under stones and on algæ. S. PLANORBIS, Fabr.

Delphinoidea, Brown, is a synonym.

FAMILY *CHORISTIDÆ.*

Shell heliciform, thin, perforate, covered by an epidermis; aperture oval, peristome continuous, sharp. Operculum corneous, spiral.

Head short, large, two short anterior tentacles are connected by a frontal veil, the posterior tentacles are simple, thick, conical; no eyes; proboscis retractile; foot large, oval, with two anterior ten-

tacular processes; a papilla on either side between the mantle and foot, and two posterior threads below the operculum. Jaws elliptic. Radula with three rachial teeth, of which the middle is very small, the others unicuspid, lateral tooth large, bicuspid, marginal small, curved, simple, a small basal plate exterior to them (Pl. 54, fig. 5).

Genus CHORISTES, Carpenter. 1872.

The characters are those of the family, the systematic position of which is very uncertain. Verrill is inclined to place it among the tectibranchs, near Actæon, but the shell and appendages of the epipodium recall Rissoid characteristics.

C. ELEGANS, Carp., described from Canadian post-pliocene fossils, has been found living on the New England coast, within the egg capsule of a ray.

FAMILY *HOMALOGYRIDÆ.*

Body flattened, ciliated in front, no tentacles, eyes sessile (Pl. 54, fig. 3). Radula narrow, the central tooth having a quadrangular base with large cusp, imbricated, one series on the other, a lateral, transverse plate replaces the lateral and marginal teeth. (Pl. 54, fig. 4.)

Shell planorbiform, spire involute, mouth clasping both sides of the periphery. Operculum corneous, few-whorled, nucleus central.

Genus HOMALOGYRA, Jeffreys. 1867.

Characters those of the family. H. NITIDISSIMA, Forbes & Hanley. *Europe, Greenland.*

The external characters of the animal and its dentition are peculiar, and its systematic position is uncertain.

Omalogyra, Jeffreys, and *Ammonicerina*, Costa, are synonyms.

Family *RISSOIDÆ*.

Genus RISSOIA, Frémenville. 1814.

R. VENTRICOSA, Desm. Pl. 61, fig. 15.

Whitish or flesh color, with about 12 longitudinal costæ, fading on the upper part of the body whorl, finely spirally striate, lip pale violaceous or reddish, with external varix. Length, 8 mill.

Mediterranean Sea.

R. subventricosa, Cantraine, is a synonym.

R. SPLENDIDA, Eichw. Pl. 61, fig. 16.

Scarcely pellucid, polished, white, with faint spiral series of minute chestnut punctations, often obsolete, apex and peristome violaceous, ribs about 14, rarely spirally striate. Length, 5·4 mill.

Mediterranean Sea.

The synonyms are *R. violæstoma*, Kryn., and *R. ornata*, Phil.

This species, the preceding and the next, run together in such manner that it is very difficult to distinguish them; indeed, it is very doubtful whether they are specifically distinct.

R. PLICATULA, Risso. Pl. 63, fig. 56.

Whorls rapidly increasing, flattened, with 12–14 slightly oblique, longitudinal ribs, vanishing on the lower part of the body whorl; lip strongly varicose; yellowish white, with fulvous flames between the ribs. Length, 6·3 mill.

Mediterranean Sea.

R. VARIABILIS, Muhlf. Pl. 61, figs. 16, 17; Pl. 65, fig. 4.

Whorls 7–9, convex, subangulated, with 10–12 longitudinal costæ, and punctate, spiral, impressed lines; lip externally varicose; whitish, or light brownish, with obscure, punctate, spiral, chestnut lines, and sometimes an obscure basal band, peristome violaceous. Length, 9 mill.

Mediterranean Sea.

It is *R. costata*, Desm., *R. costulata*, Risso, *R. Desmaresti*, Recluz, *R. splendida*, Sowb., *Turbo Rissoanus*, Chiaje, *R. nodulifera*, and *R. punctata*, Küster, *R. protensa* and *R. neglecta*, Locard.

? Monstr. STRANGULATA, Brusina. Pl. 65, fig. 4.

Upper portion smooth, middle longitudinally costate, body whorl tumid, smooth, suture deep; vitreous white, peristome violaceous. Length, 4·5 mill.

Dalmatia.

Monterosato considers this a monstrosity of *R. variabilis*.

R. DECORATA, Phil. Pl. 62, figs. 30, 31.

Rather solid, shining, scarcely pellucid, vitreous white, apex violaceous, with longitudinal chestnut lines between the ribs, sometimes tessellated with chestnut; longitudinal ribs 12, thick, spiral striæ close, densely punctate; aperture chestnut-violaceous, with a white exterior varix. Length, 5 mill.

Mediterranean Sea.

The synonyms are *R. pulchella,* Danilo and Sandri, *R. Lanzai,* Dunker, and var. *lineolata,* Brusina.

R. FRAUENFELDIANA, Brusina. Pl. 66, fig. 37.

Solid, turreted, with very convex, subangulated whorls and deep suture, with strong, rounded, elevated ribs, fading below the middle of the body whorl, crossed by close striæ; lip varicose, produced; color vitreous white, peristome violaceous, varix white.

Length, 5 mill.

Dalmatia.

More narrowly elongated, with more numerous whorls and more elevated ribs than the preceding species.

R. nodosa, Brusina, is a synonym.

R. GUERINI, Recluz. Pl. 62, figs. 36, 34, 35.

With about 10 thick, rounded, longitudinal ribs, and punctate spiral striæ, last whorl subinflated, usually smooth; lip varicose externally; brownish, with close, zigzag, longitudinal chestnut lines. Length, 5·8 mill.

Europe.

R. speciosa, Brusina, is a synonym.

Var. COSTULATA, Alder. Figs. 34, 35.

Narrower, yellowish, apex and aperture violaceous.

R. subcostulata, Schwartz, is a synonym.

R. AURANTIACA, Watson. Pl. 65, fig. 5.

Subopaque, subgradate, with deep suture; ribs 18–20, double the width of the interstices, fading out towards the base, with a dozen rounded spiral liræ, sometimes a little nodulous above; lip thin, thickened externally; orange color, whitish towards the aperture.

Length, 3 mill.

Canary Is.

R. MELANOSTOMA, Requien, and var. AMPHORULA, Brugn. (unfigured.)

Mediterranean.

R. SALEBROSA, Frauenf. Pl. 66, fig. 44.

Thick, somewhat shining, brownish, depressed conical, with 10–12 strong, close, rounded ribs, subnodose at the suture, and on the angulated periphery of the last whorl; whorls 5½, flattened, rapidly increasing. Length, 2·6 mill.

Sydney, Australia.

Section APICULARIA, Monts. 1884.

R. SIMILIS, Scacchi. Pl. 61, fig. 29.

Thin, pellucid, vitreous, whorls rounded, with 10–14 longitudinal ribs, vanishing about the middle of the body whorl, with punctate, impressed spiral striæ; aperture small, produced in front, lip rarely thickened externally; white, peristome violaceous.

Length, 5 mill.

Mediterranean Sea.

R. arata, Risso, *R. ovatella*, Forbes, *R. rubrocincta*, and *R. apiculata*, Danilo and Sandri and vars. *apicina*, *striata*, *decurtata*, and *lævis*, Monts., are synonyms.

R. gemmula, Fischer, is probably a juvenile of this species.

R. EHRENBERGI, Phil. Pl. 61, fig. 27.

Solid, upper whorls smooth, the others with from 12–14 longitudinal plications, and spirally striated, lower part of body whorl not plicate, lip acute, rarely thickened; whitish, pearly or light yellowish, with chestnut flames at the suture, inner lip violaceous, outer lip with a spot at the base. Length, 3·7 mill.

Mediterranean Sea.

It is *R. elegans*, Brusina.

R. d'ORBIGNYI, Audouin. Pl. 67, fig. 68.

Imperforate, rather solid, with 8–10 longitudinal rounded ribs, spirally lirate; whorls 6, convex, suture distinct; aperture a little effuse below. Length, 3 mill.

Red Sea.

R. INCONSPICUA, Alder. Pl. 62, fig. 52.

Rather solid, but translucent, polished, whitish or light yellowish white, sometimes milk-white, occasionally obscurely maculated or shortly strigate with chestnut, apex corneous; numerously, narrowly costate, the interstices closely spirally striate; lip with white varix. Length, 1·8 mill.

Europe.

R. maculata, Brown, *R. variegata*, Schwartz, and var. *globosa*, Mörch (*R. Kisloensis*, Dunker), are synonyms.

R. DELICIOSA, Jeffreys. Pl. 63, fig. 85.

Narrowly rimate, somewhat thick, semipellucid, shining, white, with curved, acute, distant costæ and more numerous spiral liræ, of which the basal ones are more distinct; lip simple, thin, with exterior varix. Length, 2 mill.

Southern Europe.

Jeffreys has indicated a var. *multicostata.*

R. SYNGENES, Verrill. Pl. 68, fig. 97.

Imperforate, white, with 14–16 longitudinal, subdistant ribs, vanishing on lower part of body whorl, with closer spiral liræ, crossing the ribs, and more conspicuous on the base; there are also microscopic, close spiral striæ. Length, 3 mill.

Off Cape Hatteras, N. C.

R. FAYALENSIS, Watson. Pl. 67, fig. 72.

Nearly imperforate, white, with about 12 narrow, nearly continuous, distant, longitudinal ribs, fading below the periphery, somewhat remotely, feebly, spirally striate throughout; whorls 5, convexly conical, with linear, somewhat impressed suture; lip not varicose. Length, 1·67 mill.

Azores; 450–500 fms.

R. PYRRHIAS, Watson. Pl. 67, fig. 70.

Scarcely perforate, glossy, translucent white, with 13 strong, distant ribs, fading below, with distant, faint spiral striæ throughout, stronger on the base; whorls 6, flatly conical, rapidly increasing, suture slightly margined; lip varicose. Length, 2·75 mill.

Off Culebra Is., W. I.; 390 fms.

R. TRAJECTUS, Watson. Pl. 67, fig. 78.

Imperforate, strong, white, with about 18 narrow, rounded ribs, stopping on the periphery, spirally lirate throughout, stronger on the base; whorls 5, slopingly, slightly convex, suture linear.

Length, 1·5 mill.

Off Cape York, Australia.

R. MICROSTOMA, Watson. Pl. 67, fig. 75.

Imperforate, translucent, glossy, white, with 10–12 distant, rounded ribs, more or less continuous, microscopically spirally striate; whorls 6, slightly convex, roundly angulated at the periphery; aperture very small; lip varicose. Length, 3 mill.

Off Culebra Isl., W. I., 390 fms.

R. NOVARENSIS, Frauenf. Pl. 66, fig. 45.

Imperforate, thick, whitish, with two fulvous bands, with 12–13 narrow ribs, the interstices spirally striate; whorls 6, convex, subgradate; lip produced, varicose. Length, 3 mill.

Hab. unknown.

R. LILACINA, Recluz. Pl. 62, fig. 40.

Obtuse, solid, porcellanous, shining, violaceous, with curved distant ribs, and spiral, densely punctate, impressed striæ, apex dark violet; peristome thick, white, violet-margined, bidentate within, varix white, with an orange streak behind it. Length, 5 mill.

Atlantic Coast of France.

Turbo violaceus, Muhlf., is a synonym.

Section RISSOSTOMIA, Sars. 1878.

R. MEMBRANACEA, Adams. Pl. 61, figs. 19–26.

Rather thin, membranaceous, subhyaline, smooth or longitudinally costate, the last whorl inflated, smooth or with short costæ, lip expanded and thickened; corneous or brownish, with undulating, longitudinal chestnut lines, sometimes absent; outer lip usually with three chestnut spots. Length, 7–9 mill.

Europe.

Varies greatly in texture and sculpture.

The synonyms are *R. labiosa*, Montg., *R. fragilis*, Mich., *R. Souleyetiana*, Recluz, *R. pulla*, Brown, *R. cornea*, Lovén (Figs. 25, 26).

Var. OCTONA, Nilsson. Figs. 23, 24.

Shell narrower, more cylindrical.

Var. *angustissima*, Weinkauff, is a synonym.

R. LINEOLATA, Michaud. Pl. 61, fig. 28.

Thin, hyaline, vitreous, with 14–16 slightly oblique longitudinal ribs, last whorl ventricose, the lower part smooth; aperture subdilated below; color light yellowish or corneous, with narrow, longitudinal fulvous strigations, which become flexuous below, lip with a single spot below.

France.

R. LIA, Benoit. Pl. 62, fig. 33.

Rather solid, opaque, fulvous brown with white apex, with rounded longitudinal ribs and thin spiral striæ, the sculpture often obsolete on the last whorl; lip simple, columella tinted with violaceous. Length, 4 mill.

Mediterranean Sea.

R. DESMARESTI, Audouin. Pl. 67, fig. 67.

Thin, elevated conical, with 10–12 low longitudinal costæ, fading out towards the base; whorls 6, slopingly flattened, suture distinct; peristome simple. Length, 3 mill.

Red Sea.

R. WAABITICA, Issel. Pl. 68, fig. 98.

Rimate, somewhat solid, a little shining, opaque, white, longitudinally thinly costate, sculpture fading above the middle of the body whorl; interstices spirally striate; whorls 4½, slightly convex, with distinct suture; lip simple. Length, 1·3 mill.

Red Sea.

R. PSAMMITICA, Issel. Pl. 68, fig. 99.

Rimate, fragile, subopaque, slightly shining, white, densely decussated by longitudinal ribs, fading out anteriorly, and close spiral striæ; whorls 4½, suture a little impressed; peristome thin.

Length, 1 mill.

Red Sea.

Section PERSEPHONA (Leach. 1852), Monts. 1884.

R. VIOLACEA, Desm. Pl. 62, figs. 37–39.

Solid, with subangulate periphery; longitudinal ribs 10, short on the last whorl, which is ornamented with spiral series of punctations; lip externally thickened; whitish, purplish on the spire, the periphery purple-zoned, peristome violaceous, the varix white.

Length, 5·3 mill.

Europe.

It is *R. punctata*, Potiez, *R. purpurea*, McAndrew, *R. amethystina*, Renier.

Var. RUFILABRUM, Alder. Fig. 38.

Corneous, yellowish or greenish yellow, not banded, lip chestnut color.

It is *R. hyalina*, Desm.

Var. PORIFERA, Lovén. Fig. 39.

Corneous or yellowish, periphery rounded; without ribs, deeply spirally pitted; peristome chestnut color.

Var. *ecostata*, Jeffreys, is a synonym.

Section SCHWARTZIA, Bucq., Dautz., Dollf. 1884.

R. MONODONTA, Bivona. Pl. 62, fig. 41.

Thick, hyaline, very smooth, shining, last whorl sometimes a little angulated; aperture expanded below, lip varicose exteriorly,

columella unidentate; whitish, irregularly flexuously strigate with chestnut, darker behind the varix, columella, periphery and apex violaceous. Length, 5·8 mill.

Mediterranean Sea.

It is *R. subcarinata*, Cantr., *R. dentata*, Dan. et Sandri.

R. VENUSTA, Phil. Pl. 62, fig. 32.

Thick, with 14–16 strong, rounded ribs, those of the body whorl terminating at the subangulated periphery, suture undulated; peristome subexpanded, varicose, columella bluntly unidentate; yellowish brown, with numerous chestnut longitudinal, sometimes flexuous lines, ribs white. Length, 7 mill.

Mediterranean Sea.

R. oblonga, Midd., is a synonym.

R. GROSSA, Mich. Pl. 66, fig. 36.

Thick, strongly, irregularly plicate; columella subplicate; yellowish white, with chestnut strigations between the ribs on the last whorl, and two maculations on the varicose lip. Length, 8 mill.

Mediterranean Sea.

R. OBLONGA, Desm. Pl. 62, fig. 45.

Shining, hyaline, with twelve wide longitudinal plications, short on the last whorl, suture subundulated; lip varicose, columella subplicate; white, fulvous between the ribs, three fulvous maculations on the lip. Length, 5 mill.

Mediterranean Sea.

It is *R. elongata*, Brusina.

R. ELATA, Phil. Pl. 62, fig. 44.

Shell with acute spire, shining, upper whorls smooth, afterwards with strong, irregular rounded costæ, evanescent on the base; lip much thickened, expanded, varicose; white, with fulvous short flames between the ribs, and three fulvous spots on the lip.

Length, 8 mill.

Mediterranean Sea.

R. cylindracea, Kryn., is probably a synonym.

Jeffreys makes this species a variety of *R. membranacea*.

R. PARADOXA, Monts. (unfigured.) *Mediterranean.*

Section ZIPPORA, Leach. 1847.

R. AURISCALPIUM, Linn. Pl. 62, figs. 42, 43.

Narrow, subulate, with acute apex, hyaline, translucent, smooth or obsoletely widely costate, vanishing on the last whorl, base with

three or four spiral series of pits; aperture expanded below, lip dilated, varicose; whitish or yellowish, often strigate with chestnut, varix sometimes three-spotted with chestnut. Length, 7·6 mill.

Mediterranean Sea.

Readily distinguished by its Clausilia-like appearance. The synonyms are *R. marginata*, Laskey, *R. acuta*, Desm., *R. acicula*, Desm., *R. Drummondi*, Leach, *R. pulchella*, Risso, *R. latilabre*, Jan, and var. *expansilabris*, Bucq., Dautz., Dollf.

R. Sismondiana, Issel. Pl. 67, fig. 69.

Imperforate, thin, whitish, a little shining; longitudinally densely costulate, the interstices minutely spirally striate; whorls 9, slightly convex, suture margined; lip acute. Length, 2·5 mill.

Suez.

Section Turbella, Leach. 1847.

R. parva, DaCosta. Pl. 62, figs. 46–48.

Rather solid, smooth, shining, white or yellowish, variously clouded and irregularly banded with fulvous; with narrow, subdistant longitudinal rounded ribs, terminating abruptly on the middle of the body whorl, the intervals spirally striate; lip with a white varix, bearing two fulvous spots. Length, 4·3 mill.

Europe.

The synonyms are *Turbo albulus*, *æreus* and *subluteus*, Adams, *R. cerasina*, Brusina, *R. obscura*, Phil., *R. semicostulata*, Anton.

R. interrupta, Adams. Pl. 62, figs. 49, 50.

Thin, nearly pellucid, smooth, somewhat shining, with two interrupted irregular chestnut bands and intermediate chestnut flames, lip maculate with chestnut. Length, 4·3 mill.

Europe.

By some authors considered a variety of *R. parva*. It is *R. Matoniana*, Recluz.

R. dolium, Nyst. Pl. 62, fig. 51.

Hyaline, shining, whorls 5, rapidly increasing, with deep suture, with 14 plicæ and intermediate sulcations, abruptedly terminating on the periphery of the last whorl; lip scarcely varicose.

Length, 2·3 mill.

Mediterranean Sea.

It is *R. pusilla* and *R. nana*, Phil., *R. pulchra*, Forbes.

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R. PULCHELLA, Phil. Pl. 62, figs. 53, 54.

Subperforate, obliquely subdistantly plicate, last whorl with the plicæ short, or smooth; yellowish, with fulvous flames between the ribs, often unimaculate on the base of the lip. Length, 2·3 mill.

Mediterranean Sea.

R. RADIATA, Phil. Pl. 63, fig. 55.

Imperforate, thin, hyaline, yellowish brown, irregularly fasciate, and strigate between the ribs with chestnut, lip with a chestnut spot; with or without a few obtuse ribs, vanishing at the periphery. Length, 4·2 mill.

Mediterranean, England.

It is *R. parva*, Jeffreys, *R. undata*, Bivona.

Var. SIMPLEX, Phil.

Very smooth, white or yellowish, with undulating chestnut longitudinal lines.

R. AMBLIA, Watson. Pl. 67, fig. 74.

Narrowly umbilicated, thin, glossy, horny white, with about 20 rounded, wavy ribs and narrower furrows, vanishing at the periphery, below it spiral threads; whorls 5½, moderately convex, with impressed suture, periphery very obsoletely angulated; outer lip thin. Length, 2·25 mill.

Off Palma, Canaries; 1125 fms.

R. ALGERIANA, Monts. Pl. 65, fig. 20.

Imperforate, with rounded longitudinal ribs and about equal interspaces, yellowish brown, with a brown subsutural band and three more on the base; lip simple, sharp. Length, 3 mill.

Algiers.

Monterosato remarks that it belongs to the same group as *R. Montagui*, and Weinkauff thinks it will prove a variety of that species.

Var. RUFULA, Monts.

Uniform reddish brown.

R. PINNÆ, Krauss. Pl. 68, fig. 88.

Imperforate, somewhat solid, shining, white, lineolate with chestnut, with 8–9 obtuse, remote longitudinal ribs, and obsolete spiral striæ; whorls 7, convex, with impressed suture; lip acute. Length, 5·8–6 mill.

Cape of Good Hope, on byssus of Pinna.

R. INCONSPICUA, Alder. Pl. 63, figs. 57, 58.

Rather solid, but translucent, shining; whitish or light yellowish white, occasionally milk-white, maculated or strigated with chestnut between the ribs, apex corneous; suture distinct but not deep; closely, thinly, longitudinally costate, less numerous and stronger in the last whorl, with close spiral striæ; lip white-varicose.

Length, 1·8 mill.

Europe.

It is *R. maculata*, Brown.

Var. VARIEGATA, Schwartz. Fig. 58.

Shell smooth, yellowish brown, longitudinally flamed with chestnut.

R. ALBELLA, Loven. Pl. 63, figs. 59–62.

Hyaline, subinflated, with convex whorls, spire costate, body whorl smooth, or distantly longitudinally costate above, or spirally striate; inner lip free, forming an umbilical fissure; whitish, flamed with chestnut at the suture and base, apex violaceous.

Length, 3–3·6 mill.

Northern Europe, Mediterranean Sea?

A very variable species; it is *R. Benzi*, Aradas & Benoit, *R. Oenonensis*, Brusina, *R. supracostata*, Sowb., *R. Targioni*, Appelius.

Var. SARSI, Lovén. Figs. 60–62.

Thinner, lip acute, entirely smooth, with a series of sutural maculations.

R. MARGINATA, Mich. Pl. 63, fig. 63.

Solid, shining, narrowly, rather distantly costulate, suture subundulated, white-margined; yellowish brown, ribs, base of body whorl and varix white, bimaculate with chestnut behind the varix.

Length, 5 mill.

Mediterranean Sea.

R. ANGULATA, Jeffreys. Pl. 65, fig. 16.

Imperforate, solid, opaque, a little shining; whorls 4, compressed, with 10–12 slightly curved strong ribs, and no spiral striæ, periphery distinctly angulated; lip acute. Length, 2 mill.

Adventure Bank, Mediterranean.

R. XANTHIAS, Watson. Pl. 67, fig. 71.

Scarcely rimate, thin, glossy, translucent white, with from 12–16 narrow, continuous ribs, vanishing towards the base—where there

are some faint spiral threads; whorls 7, flattened, the last with subangular periphery; aperture small, lip without varix.

Length, 2 mill.

Off Culebra Isl., W. I.; 390 fms.

R. Pernambucensis, Watson. Pl. 67, fig. 73.

Imperforate, polished, white, with 15–20 round, flexuous ribs, and broad interspaces, with faint microscopic spiral markings; whorls 5, flat, periphery not angulated; lip varicose.

Length, 2 mill.

Off Pernambuco, Brazil; 350 fms.

R. aurita, Monts. Pl. 65, fig. 17.

Close to *R. semistriata*, Mtg., but has more convex whorls, and narrow sulci. Length, 2 mill.

Algiers.

The author has only given distinctive characters for his species, and having no specimen, I cannot describe it.

R. doliolum, Phil. Pl. 65, fig. 19.

Pupiform, solid, whitish, or yellowish; with 14–16, flattened, irregular, close ribs, and undulated suture; lip not protracted, nor varicose. Length, 2·3 mill.

Red Sea; fossil in *Sicily.*

R. euchila, Watson. Pl. 63, fig. 72.

Rather solid, vitreous, shining, subopalescent; whorls 4–5, rapidly increasing, suture distinct; with 20–30 flexuous rounded ribs, about equalling the interspaces, vanishing below, spirally lirate; yellowish white, with two or three spiral series of chestnut spots.

Length, 1·5 mill.

Madeira.

Described by Watson as *R. Novarensis*, preoccupied by Frauenfeld.

R. turricula, Jeffreys. Pl. 65, fig. 18.

Minutely rimate, thin, semipellucid, a little shining, whitish; whorls 4, tumid, rapidly increasing, with deep suture; with 20–25 thin, distant, curved costæ, and no spiral sculpture.

Length, 1·2 mill.

Atlantic Ocean (subfossil?)

R. brychia, Verrill. Pl. 68, fig. 96.

Minutely rimate, thick, brownish, with about 14 rather close rounded ribs, fading on the lower part of the body whorl, and rather

wider interspaces, no spiral sculpture; whorls 4, the apex blunt, the others very convex, with deep suture; lip rather thin, without a varix. Length, 2·3 mill.

Off New England; deep sea.

R. HARPA, Verrill. Pl. 67, fig. 82.

Umbilicated, thin, with numerous longitudinal plications, and no spiral sculpture; whorls 5, very convex, rapidly increasing, with deep suture; aperture small, round, lip thin. Length, 3 mill.

Off New England; deep sea.

R. MUNDA, Monts. (unfigured.) *Sicily.*

Section MANZONIA, Brusina. 1870.

R. COSTATA, Adams. Pl. 63, fig. 66.

Longitudinally, distantly costate, costæ acute, elevated, nodose above, spirally densely lirate; whorls convex, round-shouldered, suture deeply incised; lip double, continuous, the internal smooth, rounded, the external widely reflexed, thinly sulcate.

Length, 3 mill.

Europe.

The synonyms are *R. exigua*, Mich., *R. carinata*, Phil., *Turbo plicatus*, Mühlf., *Turbo albus*, Donovan.

R. SIBIRICA, Leche. Pl. 65, fig. 21.

Turreted, elevated, brownish; whorls 5, round-shouldered, with 9–10 obtuse ribs, vanishing on upper part of body whorl, below are a few raised spiral lines; lip simple, edentulous. Length, 5 mill.

Arctic Ocean, Siberia.

R. MIRABILIS, Manzoni. Pl. 65, fig. 22.

Scalariform, subangulate in the middle, narrowly rimate; whorls 6½, very convex, with deep suture, with narrow, distant longitudinal ribs, the wider interstices closely spirally striate; yellowish violet. Length, 2·5 mill.

Canary Is.

R. GIBBER, Watson. Pl. 65, figs. 23, 24.

Widely umbilicated, gradate, solid, white or yellowish, sometimes more or less distinctly four banded with chestnut; whorls 4½–5, convex, with stout, rounded ribs, forming an undulated shoulder or suture above; umbilicus defined by a rib; lip continuous, duplicate.

Length, 2 mill.

Madeira and Pto. Sancto.

R. PUNCTURA, Mtg. Pl. 63, fig 67.

Imperforate, semipellucid, light brownish, with a chestnut stripe outside the aperture; embryonal whorls 2, punctate, normal whorls 6, convex, with deep suture, with numerous, close ribs, and spiral liræ; outer lip varicose. Length, 3 mill.

Europe, Teneriffe.

It is *R. textilis*, Lovén, *R. puncturata*, Macgill., *R. insenghæ*, Calcara, *R. striatissima*, Rayn.

R. PARVULA, Jeffreys. Pl. 65, fig. 26.

Imperforate, somewhat solid, subtranslucent, scarcely shining; whorls 4, convex, longitudinally costate, ribs evanescent at the periphery, slightly spirally lirate, suture distinct but not deep; lip thin, smooth within. Length, 2 mill.

Portugal.

Probably not adult.

R. MACANDREWI, Manzoni. Pl. 63, fig. 68.

Imperforate, solid, yellowish chestnut; whorls 6, turreted or round-shouldered, with close, large, longitudinal ribs, rendered nodulous by spiral impressed lines; lip duplicate, the outer one expanded, with fimbriated edge. Length, 2·5 mill.

Canary Is.

Watson has described a variety SPRETA.

R. WATSONI, Schwartz. Pl. 64, fig. 89.

Imperforate, thin, translucent, shining, white, with chestnut maculations on the shoulder, between the ribs, with close strong spiral ribs, and longitudinal ones distinct on the shoulder only; whorls 4½, gradate, subscalar, with flattened shoulder to an angle, suture rather deep; lip a little thickened externally. Length, 2 mill.

Madeira.

R. AUBERIANA, d'Orb. Pl. 68, fig. 85.

Imperforate, thin, white, with brownish maculations, with numerous, thin, longitudinal and spiral costæ; whorls 6, convex, with sloping shoulder defined by an angle; lip thickened.

Length, 1·5 mill.

West Indies.

R. ZETLANDICA, Mtg. Pl. 63, fig. 86.

Imperforate, solid, opaque, whitish; cancellated and almost muricated by subequal longitudinal and spiral distant liræ; whorls 7, angularly shouldered above, suture deep, longitudinal sculpture

evanescent on lower part of body-whorl, where the spiral sculpture becomes more prominent; lip thickened. Length, 5 mill.

Europe.

The synonyms are *R. cyclostomata*, Recluz, and *R. scalariformis*, Thorpe. Jeffreys adds *R. carinata*, Aradas, and *R. canaliculata*, Phil.

R. CRISPA, Watson. Pl. 65, fig. 8.

Rimate, rather solid, somewhat shining, subvitreous, white, a little orange-tinted, with about 12 oblique costæ, vanishing below, crossed by spiral liræ, of which there are 7 on the last whorl, stronger below, the intersections crispate; whorls 5–6, convex, gradate, suture deep; lip thickened, externally crenated.

Length, 2 mill.

Madeira, Canaries.

R. MAYENI, Friele. Pl. 65, fig. 28.

More or less rimate, solid, reddish brown; whorls 5, carinate, with sloping shoulders, costate above, nodose at the carina, spirally lirate below. Length, 5 mill.

Arctic Ocean.

First published as *R. Jan-Mayeni;* subsequently simplified as above.

Friele has described a var. ALBA.

R. SIMULANS, Monts. Unfigured. (*R. Watsoni*, Monts., not Schwartz.) *Mediterranean.*

Section FOLINIA, Crosse, 1868.

R. INSIGNIS, Folin. Pl. 63, fig. 70.

Turreted, distantly obliquely ribbed, the extremities of the ribs undulating the shoulder of the whorls, spirally striate; whorls 5, rapidly increasing; lip wide, outer margin crenulated.

Length, 2·2 mill.

Panama.

The remarkable distinctive character of this group is the small posterior sinus of the aperture.

R. PHARAONICA and R. CLEOPATRÆ, Folin (unfigured.) *Egypt.*

Subgenus SABANÆA, Leach, 1847.

R. FLAMMEA, Frauenf. Pl. 63, fig. 64.

Thick, smooth, subpellucid, shining, vivid brick red; whorls 5, subgradate, with incised suture; lip a little thickened.

Length, 2 mill.

Botany Bay.

R. INCIDATA, Frauenf. Pl. 63, fig. 65.

Conoidal, thick, smooth, brownish; whorls 5, flattened, suture and periphery channeled; lip thickened. Length, 1·4 mill.

Botany Bay.

Section CORENA, A. Ad., 1870.

R. TUBERCULIFERA, A. Ad. (unfigured.) *Gulf of Suez.*

Section AMPHITHALAMUS, Carp., 1865.

R. MICROTHYRA, Martens. Pl. 63, fig. 69.

Smooth, a little shining, brownish corneous, sometimes with a white thread at the suture, smooth; whorls 5, slightly convex; aperture small, subcircular, peristome simple, thick. Length, 1·5 mill.

Mauritius.

R. BADIA, Watson. Pl. 67, fig. 81.

Scarcely umbilicated, smooth, shining, translucent chestnut, with fine growth lines, and a few microscopic spiral striæ, most apparent towards the top of the whorls and on the base; whorls 4½, slightly convex, rapidly increasing, with narrow, distinct suture; aperture produced from the body whorl, with duplicate, continuous lip.

Length, 1·5 mill.

Port Jackson, Sydney, Australia.

R. SCROBICULATOR, Watson. Pl. 67, fig. 80.

Pupiform, strong, shining, crimson-chestnut color, obliquely striate, with faint spiral striæ, more distinct below the suture and near the base; whorls 4½, flattened, suture linear; aperture somewhat detached and projecting, oblique, with duplicate continuous lip.

Length, 1·1 mill.

Port Jackson, Sydney, Australia.

R. OLIVACEA, Dunker. Pl. 66, fig. 43.

Imperforate, subpupiform, thick, a little shining, fulvous, obliquely longitudinally plicate, the plicæ 25–26 in number, upper part of spire smooth; whorls 6, flatly convex, with slightly incised suture; peristome duplicate, continuous. Length, 2 mill.

Sydney, Botany Bay, Australia.

R. FRAUENFELDI, Schwartz. Pl. 68, fig 86.

Thick, subpellucid, chestnut color, smooth towards the apex, below with 18–20 somewhat oblique longitudinal plicæ; whorls 6½, somewhat convex, with impressed suture; peristome thick, continuous, duplicate?. Length, 3·2 mill.

Sydney, Australia.

Unfigured Species.

R. LACUNATA, R. INCLUSA, Carp. *California.*
R. OBESA, R. PUPOIDES, H. Ad. *Lord Hood's Isl.*
R. PELLYÆ, Nevill. *Adelaide, So. Australia.*

Section NODULUS, Monts. 1878.

R. CONTORTA, Jeffreys. Pl. 69, figs. 40–42.

Narrowly umbilicated, somewhat solid, shortly cylindrical with obtuse apex, yellowish or white, with two fulvous bands, smooth, shining; whorls 4, ventricose, with deep suture; aperture subrotund, subeffuse, peristome continuous. Length, 1·2 mill.

Mediterranean Sea.

Var. ELATA, B. D. D. Fig. 41.

Spire lengthened.

Var. INTORTA, Monts. Fig. 42.

Spire shorter, very smooth, last whorl more solute.

R. NITIDA, Brusina. Pl. 69, figs. 43, 44.

Rather solid, white, vitreous, transparent, apex obtuse; whorls 6, slightly convex, smooth, suture not deep; lip continuous, slightly varicose, a little produced below. Length, 2·25 mill.

Mediterranean Sea.

It is *R. glabrata*, var. *nitida*, Brusina.

R. GLABRATA, Mühlf. Pl. 69, figs. 45, 46.

Pupiform, rather solid, opaque, smooth, fulvous brown; whorls 6, somewhat convex, the last narrower than the preceding whorl, suture not deep; peristome thick, continuous, patulous at the base.

Length, 1·5 mill.

Mediterranean Sea, Madeira.

R. punctulum, Phil., *R. Mandralisci*, Aradas, and *R. sabulum*, Cantraine (fig. 46), are considered synonyms.

R. LINCTA, Watson. Pl. 69, fig. 47.

Rather thick, transparent, glossy, white, sometimes with a yellowish cast, smooth, barely microscopically striate, more distinctly so at the base; whorls 4–4½, convex, suture deep; peristome subcontinuous. Length, 1·5 mill.

Madeira.

R. LÆVIS, Monts. Pl. 69, fig. 48.

The only description of this species is "Its solidity and the teeth of the aperture readily distinguished it from its congeners." The figure does not exhibit any apertural teeth.

Algiers.

It belongs to Monterosato's group *Peringiella.*

R. EPIDAURICA, Brusina. Pl. 69, fig. 49.

Minute, aciculately-subcylindrical, obtuse, thin, hyaline, very smooth, suture moderate, aperture dilated, with simple peristome. Length, 1·5 mill.

Dalmatia, Sicily.

R. SEMINULUM, Monts.

Like *R. glabrata*, but larger, aperture more produced, peristome chestnut-margined.

Algiers.

Possibly a Barleeia.

R. NITENS, Monts. (unfigured.) *Mediterranean.*

Section ANABATHRON, Frauenf. 1867.

R. CONTABULATA, Frauenf. Pl. 69, figs. 50, 51.

Thick, shining, reddish or purplish; whorls 5½, scalariform, the upper part shouldered, and the angle carinated, there is an inferior carina on the body whorl, suture more or less channeled; lip thick, continuous. Length, 1·4 mill.

Botany Bay, Australia.

Section PELECYDIUM, Fischer. 1872.

R. VENUSTULA, Folin. Pl. 69, fig. 53.

Imperforate, white, subpellucid, transversely striate; whorls 7–8, subplanate, with linear suture, apex obtuse, mamilliform, last whorl deviately descending; aperture produced, exserted, semicircular, entire, peristome subthickened. Length.?

Sonda Strait.

R. VITREA, Garrett. Pl. 68, fig. 18.

Minute, thin, pellucid, smooth, microscopically spirally striate, shining, white; whorls 5, flattened convex, apex obtuse, suture well impressed, slightly margined; peristome rather thick, simple.

Length, 7·5 mill.

Viti Is.

Section HEMISTOMIA, Crosse. 1872.

R. CALEDONICA, Crosse. Pl. 68, fig. 20.

Subimperforate, subtranslucent, thin, light olivaceous corneous, under a darker epidermis; whorls 5½, somewhat convex, moderately increasing, with impressed suture; lip simple, continuous, subsolute.

Length, 2·5 mill.

New Caledonia, brackish water.

Subgenus CINGULA, Fleming. 1828.

Section CINGULA (sensu stricto).

R. CINGILLUS, Mtg. Pl. 69, fig. 25.

Rather solid, scarcely pellucid, yellowish brown, with two or three chestnut bands; whorls 6, flattened, spirally striate; lip acute, not thickened. Length, 4·3 mill.

Atlantic Coasts of Europe.

It is *R. vittatus*, Donovan, *R. trifasciata*, Adams, *Turbo graphicus*, Brown.

Var. RUPESTRIS, Forbes. Not banded.

R. BALTEATA, Manzoni. Pl. 69, fig. 57.

Thin, hyaline, smooth, suture widely margined, apex obtuse; whorls 3½, flattened; lip simple, solid; narrowly rimate.

Length, 1·5 mill.

Canary Is.

This should possibly be referred to Ceratia.

R. MILLERI, Folin. Pl. 71, fig. 94.

Rather smooth, with obscure decussating very minute lines, yellowish or orange color, shining; whorls 6, slopingly flattened, the last with scarcely angulated periphery, suture deep; lip thickened below, base with a few spiral striæ. Length, 3·7 mill.

Cape Verd Is.

R. CONICA, Perier. Pl. 71, fig. 95.

Shell yellowish, banded with light chestnut, two bands above the periphery of the last whorl and one below it; whorls 5, flattened,

the last with sharp peripheral angle; columella a little twisted, lip acute. Length, 2·8 mill.

Panama.

R. ANGULIFERENS, Folin. Pl. 70, fig. 62.

Shining, very minutely longitudinally and spirally striate, whitish, with a broad fulvous band on the top of the whorls, and another on the middle of the base; whorls 6, flattened with slight angle above and below the deep suture, and sharply angulated periphery; peristome acute. Length, 2·5 mill.

Panama.

R. TENUISCULPTA, Watson. Pl. 69, fig. 55.

Scarcely rimate, thin, vitreous, pellucid, yellowish white, with incremental striæ, and distant, irregular, very slight spiral lines; lip thin, a little produced below. Length, 2 mill.

Madeira, Algiers, etc.

R. SCOPULORUM, Watson. Pl. 70, fig. 60.

Thin, smooth, glossy, rufous brown; whorls 9, flattened, with obscurely angulated periphery and short base, suture slight, defined by the peripheral projection of the whorl above; lip thin, slightly patulous on the base. Length, 1·75 mill.

Reefs off Honolulu, Sandwich Is.

R. RUSTICA, Watson. Pl. 70, fig. 61.

Rather thick, white, with or without slight traces of longitudinal ribs, and traces of microscopic spiral lines, smooth, polished, apex large, rounded; whorls 6, periphery very obsoletely angular, suture linear, not impressed; lip sharp, patulous, but a little inverted above; umbilicus rimate. Length, 3 mill.

Off Pernambuco, Brazil; 350 fms.

R. ALVEARIUM, Watson. Pl. 70, fig. 59.

Slightly umbilicated, with blunt apex, barely convex whorls, suture linear; glossy white; lip simple. Length, 1·25 mill.

Off Culebra Isl., W. Indies; 390 fms.

R. MERCURIALIS, Watson. Pl. 64, fig. 92.

Imperforate, white, translucent, shining, apex obtuse; whorls 7, slightly convex, with faint growth-lines and close-set spiral striæ, suture narrowly margined, not deep; lip a little expanded.

Length, 3·75 mill.

Wednesday Isl.; N. E. Australia.

Possibly a Ceratia.

R. VILLÆ, Issel. Pl. 71, fig. 87.

Rimate, pale corneous or luteous, pellucid, a little shining, smooth, very slightly longitudinally striate; whorls 5½, convex, suture margined; peristome a little thickened. Length, 2–2·5 mill

Gulf of Suez.

R. LANTZI, Velain. Pl. 71, fig. 83.

Rather thick, upper whorls subangulated, the last with rounded periphery, with spiral engraved lines; white; lip sometimes slightly thickened externally. Length, 2 mill.

Isl. St. Paul, Indian Ocean.

R. SUBTRUNCATA, Velain. Pl. 71, fig. 88.

Thick, solid, imperforate; whorls 3, apex obtuse, all smooth, white; lip thickened within. Length, 1 mill.

Ins. St. Paul, Indian Ocean,

R. CAZINI, Velain. Pl. 71, fig 84.

White, thick, smooth, imperforate; whorls 5, slightly convex; lip strongly thickened within. Length, 2 mill.

Ins. St. Paul, Indian Ocean.

R. AUSTRALIÆ, Dunker. Pl. 71, fig. 81.

Somewhat thick, subpellucid, corneous; whorls 6, subconvex, spirally thinly lined, the last whorl with 6–7 lines.

Length, 2·4 mill.

Sydney, Australia.

R. PURPUREA, Hutton. Pl. 71, fig. 89.

Elongated, with 6 rather flattened, not polished whorls; corneous brown, becoming purple or purplish red on the spire, with a white sutural band. Length, 2·5 mill.

New Zealand.

Var. SUBFUSCA, Hutton.

Whorls 5, flattened, smooth, but not polished; pale brown.

Length, 3 mill.

R. CYCLOSTOMA, Tenison Woods. Pl. 71, fig. 8.

Scarcely perforate, smooth, opaque, olivaceous or brownish, lighter or whitish colored below the suture, apex obtuse; whorls 6, flatly convex, thinly striated; aperture small, rounded, produced.

Length, 4 mill.

Tasmania.

The author describes a variety ROSEA, which differs only in color.

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R. SEMICARINATA, Folin. Pl. 70, fig. 58.

Whitish, subdiaphanous, whorls flatly convex, spirally cingulate. Length, 1·5 mill.

New Caledonia.

R. ROBUSTA, Dall. Pl. 71, figs. 76, 77.

Shell smooth, scarcely rimate, with impressed suture; whorls 4–5, slightly convex, purplish with whitish bloom, with very fine spiral striæ particularly towards the base. Length, 5 mill.

Aleutian Is.; *Plover Bay, E. Siberia.*

Dr. Dall calls the normal form var. *Martyni*, so that that name may be substituted in the event of *robusta*, Lea being recognized.

Var. SCIPIO, Dall. Fig. 77.

Shell more slender. Perhaps males, and the stouter ones females. The occurrence of a certain number of intermediate specimens is mentioned.

R. CERINELLA, Dall. Pl. 71, fig. 79.

Narrowly rimate, smooth, not polished. Length, 3 mill.

Behring Sea.

Close to *C. proxima*, Alder, but differs in the absence of spiral striation and in having less truncate apex, and one less whorl.

C. ALEUTICA, Dall. Pl. 71, fig. 78.

Slightly umbilicated, smooth, with faint growth-lines, no spiral sculpture, suture distinct, whorls moderately convex; brownish, the slightly expanded edge of the aperture blackish. Length, 3·5 mill.

Aleutian Is.

More slender and smaller than *C. minuta*, Totten, less slender and without the sculpture of *C. aculeus*, Gould.

R. EXILIS, Tryon. Pl. 71, fig. 80.

Whorls 6, convex, with well-marked suture, aperture small, surface covered with slight revolving striæ, light brown.

Length, 3·3 mill.

San Diego, Cal., on salt-water grass.

R. STIMPSONI, Smith. Pl. 71, fig. 73.

Whorls 7, convex, with deep suture, distinctly wrinkled by growth lines, apex obtuse, shell thin, dark brown. Length, 5·7 mill.

Greenport, Long Island, New York.

I am not acquainted with this species, of which two specimens occurred to the author.

C. LÆVIS, DeKay. Pl. 71, fig. 75.

Shell moderately solid, with 5 very convex whorls, separated by a deep suture, smooth, white in adult specimens, corneous in the young; aperture small, umbilicus distinct and rather large.

Length, 5 mill.

New York, Connecticut.

This poorly described and figured species has not been recognized; it may be identical with the preceding one, or the following.

R. MINUTA, Totten. Pl. 71, fig. 74.

Thin, smoothish, apex obtuse, suture well-impressed, narrowly umbilicated, yellowish-brown to ferruginous; whorls 5, convex, very finely striate. Length, 3·75 mill.

New England, Florida.

R. GEORGIANA, Pfeffer. Pl. 71, fig. 2.

Imperforate, shining, smooth, or microscopically striate with growth-lines, whitish, under a thin greyish straw-colored epidermis; whorls 5, flattened convex, with moderately impressed suture; peristome continuous. Length, 2·4–2·8 mill.

South Georgia Isl.

Unfigured and Undetermined Species of Cingula.

R. PETININGENSIS, Gould. (Pl. 71, fig. 82.) = *Paludestrina.*
R. MODESTA, H. C. Lea. = *Assiminea.*
R. SANDERSONI, Verrill. *Cape Hatteras, N. C.*
R. CONICA, C. CONCINNA, R. SOLIDA, C. B. Ad. *Jamaica.*
R. VERRILLI, and R. ISLANDICÆ, Friele. (Desc. inaccessible to me). *Arctic Ocean.*
R. PUNCTATO-STRIATA, Tenison Woods. *Tasmania.*
R. ATOMARIA, Gould. *China Sea.*
R. SCHLOSSERIANA, Brusina. = *Leachia elongata*, Phil.
R. FILOSA, Brusina. *Suez.*
R. PAUPERCULA, C. B. Ad. = *Diala.*

Section ONOBA, H. and A. Adams, 1854.

R. STRIATA, Mtg. Pl. 63, figs. 71, 73.

Rather solid, opaque, scarcely shining, whitish or yellowish, with two chestnut bands; whorls 6–7, moderately convex, spirally closely striate, upper portion of whorls shortly longitudinally plicate; lip, in the adult, slightly varicose externally.

Length, 4 mill.

Atlantic Coast of Europe, ? Mediterranean Sea, Nahant, Mass., Halifax, N. S.

The synonyms include *R. minutissima*, Mich., *R. communis*, Forbes, *R. semicostata*, Turton, *Pyramis discors* and *candidus*, Brown, *R. gracilis*, Macg., *R. Marionæ*, Macg. The American localities are for *R. multilineata*, Stimpson (fig. 73), which appears to be identical.

Var. LIRATA, Watson.

Ribs and basal spiral sculpture stronger.

Madeira.

R. SAXATILIS, Möller. Pl. 64, figs. 87, 88.

Imperforate, thin; whorls 4, very convex, with deep suture, spirally cingulated; yellowish white, translucent. Length, 3 mill.

Greenland, Behring's Sea, New England.

R. arctica, Lovén, and, I think, *R. leptalea*, Verrill (fig. 88), who has so named a single specimen occurring in New England waters, are synonyms.

R. ACULEUS, Gould. Pl. 70, fig. 64c.

Imperforate, but with a slight depression partly covered by the inner lip, apex blunt; whorls 6, moderately convex, with regular, crowded microscopic, spiral lines; aperture simple, entire; light yellowish horn color. Length, 3·5 mill.

New England.

Some European authors consider this a synonym of *R. striata*, Mtg.

R. AFFINIS, Jeffreys. Pl. 66, fig. 39.

Rather thin, semitransparent, glossy, whitish; whorls 4, slightly, indistinctly spirally striate; apex blunt; outer lip thin, somewhat expanded. Length, 2·75 mill.

Vigo Bay.

Has fewer whorls than *R. striata* or *R. aculeus*, and they are less convex than in *R. saxatilis*.

R. ARENARIA, Mighels and Adams. Pl. 63, figs. 74, 75.

Whorls 6, convex, longitudinally subplicate, minutely spirally striate, suture impressed, whitish. Length, 2·5 mill.

Greenland, Canada, Maine, Spitzbergen.

Stimpson changed the name to *R. Mighelsi* on account of *Turbo arenarius* (Mtg.?) Maton, Turton, etc., which, however, is *Odostomia decussata*. *R. exarata*, Stimpson, is a synonym; but the figure of

that species in Gould's Invertebrata of Massachusetts (fig. 75), must represent an extreme variety.

R. BRACHIA, Watson. Pl. 64, fig. 90.

Umbilicated, thin, translucent, whitish; whorls 4, rounded, spirally carinated, carinæ 5 on the upper part of the last whorl, with several less distinct ones on the base; outer lip sharp, varicose externally. Length, 1·25 mill.

N. of Culebra Isl., West Indies; 390 fms.

R. MORCHII, Collin. Pl. 69, fig. 56.

Narrowly perforate, semipellucid, yellowish brown, apex obtuse; whorls 4, convex, with channeled suture, spirally ridged, about eight ridges on the last whorl. Length, 3 mill.

Siberian Sea.

R. CARINATA, Mighels and Adams. Pl. 63, fig. 76.

Shell very thin, ferruginous; whorls 5, convex, the upper ones with longitudinal ribs, the lower half of the body whorl spirally striate; aperture nearly orbicular, peristome thin and sharp.

Length, 2·6 mill.

Maine, northwards.

It is *R. semicostata*, Migh. and Ad. (not Mtg.), and *R. pelagica*, Stimpson.

R. AEDONIS, Watson. Pl. 64, fig. 91.

Rather strong, subtransparent, white, apex blunt; whorls 5, convex, spirally lirate, about 15 on the last whorl, the interspaces much wider; outer lip sharp, thin. Length, 2·5 mill.

Nightingale Isl., Tristan da Cunha; 100 to 150 fms.

R. TRANSENNA, Watson. Pl. 64, fig. 100.

Narrowly umbilicated, apex obtuse, translucent white; whorls 5–5½, moderately rounded, with a smooth space below the suture, then spiral threads, 16–18 on the body whorl, separated by wider interspaces; outer lip sharp, with a feeble external varix.

Length, 2·5 mill.

Between Marion and Prince Edward Is.; 140 fms.

R. PACHIA, Watson. Pl. 64, fig. 98.

Scarcely perforate, subtransparent, suture scarcely impressed, white; whorls 5, narrowly, concavely shouldered, then convex, with faint spiral threads and wider interspaces; lip sharp, with a remote external varix. Length, 2·5 mill.

Off Pernambuco, Brazil; 350 fms.

R. GLAPHYRA, Watson. Pl. 64, fig. 97.

Scarcely perforate, thin, hyaline, white, apex blunt, suture narrowly margined, slightly impressed; whorls 5, very feebly ribbed at the suture of the body whorl, very faintly, spirally flat-ridged and furrowed; outer lip thin and sharp. Length, 1·5 mill.

Off Nightingale Isl., Tristan da Cunha; 100–150 fms.

R. MONIZIANA, Watson. Pl. 63, fig. 80.

Umbilicated, rather thin, frosted (not glossy), transparent, slightly longitudinally puckered beneath the suture; whorls 4–5, convex, with a narrow, sloping shoulder, spirally ridged, ridges on body whorl 7–9; lip subexpanded, thick. Length, 1·75 mill.

Madeira Is.

R. CASTANEA, Möller. Pl. 63, fig. 77; Pl. 64, figs. 95, 96.

Imperforate, opaque, chestnut color, apex obtuse; whorls 4½, convex, with impressed suture, and distinctly angulate, about 12 lines on the last whorl. Length, 4 mill.

Norway, Iceland, Greenland, Behring's Sea, Gulf of St. Lawrence.

Var. ALASKANA, Dall. Fig. 96.

Thinner, with rather prominent sutural wrinkles, smaller, with same number of whorls. Under the pale, yellowish epidermis, the shell is pinkish. Length, 2·5 mill.

Behring's Sea.

R. CASTANELLA, Dall. Pl. 64, fig. 93.

Whorls 5, convex, spirally ridged, about 6 to 12 on the body whorl, varying in number; narrowly umbilicated; peritreme continuous, slightly thickened; pinkish or brownish white under the epidermis. Length, 2·7 mill.

Behring's Sea.

R. AURIVILLII, Dall. Pl. 64, fig. 94.

Narrowly umbilicated, waxen or yellowish; whorls 5½–6, with strong spiral ridges and concave, much wider interspaces, there are about 8 ridges on the body whorl; lip continuous, slightly thickened. Length, 4·3 mill.

Aleutian Is.

R. GRISEA, Martens. Pl. 68, fig. 92.

Scarcely umbilicated, semipellucid, reddish grey, whitish near the aperture, under an ash colored, caducous epidermis; whorls 4, convex, with low spiral cingulæ, separated by narrow impressed striæ; lip thickened, interior orange-corneous. Length, 2·25 mill.

South Georgia.

R. CINGULATA, Phil. Pl. 68, fig. 93.

Somewhat solid, translucent; whorls 6, convex, with linear suture, spirally lirate, with wider interspaces, 10 liræ on the last whorl; lip simple, sharp; yellowish brown. Length, 4 mill.

Sicily.

R. TENERA, Phil. Pl. 68, fig. 94.

Thin, pellucid, brownish white; whorls 5, with deep suture, and strong spiral ridges, of which there are 9–10 on the last whorl, the wider interstices slightly longitudinally striated; lip simple, dentate by the ridges. Length, 2 mill.

Near Syracuse, Sicily.

R. CRISTALLINULA, Manzoni. Pl. 65, fig. 7.

Vitreous, translucent, shining; whorls 5, with margined suture, the last numerously spirally striate; lip a little thickened, subproduced; subperforate. Length, 1·5 mill.

Canary Is.

R. CALLOSA, Manzoni. Pl. 65, fig. 6.

Imperforate, solid, opaque, whitish, with short spire and indistinct, submargined suture; whorls 5, closely spirally striate, last whorl inflated; lip simple, rather thick. Length, 1·6 mill.

Canary Is., Madeira.

R. depicta, Manzoni (= *R. punctifera*, Watson Ms.) is a synonym.

R. LAURÆ, Folin. Pl. 71, fig. 99.

Polished, crystalline, smooth, obscurely spirally lirate at the periphery and base; whorls 8, slightly convex, with shallow suture; aperture with thickened lip, spirally lirate within. Length, 2 mill.

Panama.

Unfigured and Undetermined Species.

R. DELICATA, Phil. *Red Sea.*

R. LIGATA, Gould. *Hong Kong.*

R. PROCERA, R. SUBULINA, R. ELEGANTULA, R. MUNDULA, R. SPIRATA, R. PATULA, R. MIRIFICA, R. LUCIDA, R. EGREGIA, all of Arthur Adams. *Japan.*

R. ALBOLIRATA, Carp. *Cape St. Lucas, L. California.*

R. TURRICULA, H. C. Lea. *So. Carolina.*

This species has not been identified.

Section CERATIA, H. and A. Adams, 1854.

R. PROXIMA, Alder. Pl. 63, fig. 82.

Somewhat solid, a little shining, semipellucid, yellowish white; whorls 6, convex, with impressed suture, almost smooth, very slightly spirally striate; lip a little thickened, but not varicose.

Length, 3 mill.

Europe.

R. striatula, Jeffreys and probably *R. pupoides*, Requien, are synonyms.

R. MACRA, Watson. Pl. 64, fig. 99.

Imperforate, thick, subtransparent white, apex obtuse; whorls 6, rather flat, with narrowly margined suture, and slight spiral striæ; outer lip sharp, very feebly varicose. Length, 2·5 mill.

Off Nightingale Isl., Tristan da Cunha; 100–150 fms.

R. TRUNCATA, Garrett. Pl. 63, fig. 79.

Imperforate, thin, pellucid, shining, white, apex blunt; whorls 5, slightly convex, closely spirally striate; peristome thick, slightly expanded. Length, 2 mill.

Viti Is.

Unfigured Species.

R. PYRGULA, A. Ad. — *Gulf of Suez.*
R. MACCOYI, Tenison Woods. — *Tasmania.*
R. VARIEGATA, Tapparone. — *Papuan Is.*

Section HYALA, H. and A. Adams. 1854.

R. VITREA, Mtg. Pl. 63, fig. 81.

Imperforate, thin, semipellucid, yellowish white, smooth, very lightly spirally striate, apex obtuse; whorls 6, convex, oblique, with deep suture; lip simple, thin, contracted. Length, 4 mill.

Europe.

It is *R. glabrata*, Fleming, *R. crystallina* and *R. virginea*, Brown.

Unfigured Species.

R. CONCINNA and R. NITIDA, A. Ad. — *Gulf of Suez.*
R. PUMILA, A. Ad. — *Gulf of Suez, Japan.*
R. GLABRATA, Phil. — *Japan.*

Section PLAGIOSTYLA, Fischer, 1872.

R. ASTURIANA, Fischer. Pl. 66, fig. 52.

Smooth, translucid, spire papillary, imperforate, white; whorls 4½, subglobose, suture margined, last whorl obliquely ventricose; lip subthickened, columella callous. Length, 2·5 mill.

Asturia, Spain.

Section SETIA, H. and A. Adams. 1854.

R. SEMISTRIATA, Montagu. Pl. 69, fig. 21.

Subsolid, scarcely pellucid, a little shining, whitish with two or three spiral series of faint chestnut maculations, suture deep; whorls 5, convex, spirally striate, base rimate. Length, 2·3 mill.

Europe.

R. marmorata, Cantr., *R. maculata*, Monts., *R. subsulcata*, Phil., *R. tristriata*, Thompson, *R. pulchra*, Johnson, and possibly *R. granulum*, Phil., *R. aemula*, Granata, and *R. Galvagni*, Aradas, are synonyms.

R. PULCHERRIMA, Jeffreys. Pl. 69, figs. 22, 26.

Thin, smooth, striulate, subperforate; whitish, with four spiral series of chestnut maculations on the last whorl, sometimes more or less confluent into strigations, apex obtuse, mamillary; whorls 4, very convex, with deep suture, last whorl expanding towards the aperture, base rimate. Length, 2 mill.

Europe.

R. amabilis, Monts., is probably a synonym, and I think that *R. depicta*, Weinkauff (fig. 26), not Manzoni, may also be placed here.

R. PICTA, Jeffreys. Pl. 69, fig. 23.

Somewhat solid, semipellucid, shining, spirally striated, yellowish white, with spiral series of chestnut spots, apex obtuse, suture moderate, submargined; whorls 5–6, compressed rounded, base imperforate. Length, 1·75 mill.

Portugal, Canary Is., Madeira.

Probably a variety of *R. semistriata.*

R. BENJAMINA, Monts. Pl. 69, fig. 24.

Thin, transparent, yellowish, very slightly striate, with series of chestnut maculations, apex obtuse; whorls 5, slightly convex, with distinct suture, base imperforate; lip acute. Length, 2 mill.

Mediterranean Sea, Portugal.

It is *R. concinna*, Monts., not S. Wood, and probably a variety of *R. semistriata.*

R. PERMINIMA, Manzoni. Pl. 69, fig. 28.

Imperforate, smooth; whorls 4, yellowish, with or without bands of small chestnut spots, suture margined. Length, 1·25 mill.

Canaries, Madeira.

Too closely allied to *R. pulcherrima*, Jeffreys.

R. ALBUGO, Watson. Pl. 69, fig. 27.

Scarcely rimate, pellucid, thin, smooth, whitish or yellowish, with series of small quadrate chestnut spots, sometimes confluent, with a series of opaque white spots on the periphery; whorls 5½, subangular, spirally sulcate beneath the angle; lip thin, acute.

Length, 1·6 mill.

Canary and Madeiran Is.

Perhaps only a variety of *R. semistriata*.

R. MADREPORICA, Issel. Pl. 71, fig. 86.

Rimate, thin, a little shining, densely spirally striate, white; whorls 4½, a little convex, with well-impressed, margined suture; columella a little twisted, outer lip thin. Length, 1·3 mill.

Gulf of Suez.

R. SCULPTILIS, Monts. Pl. 71, fig. 93.

Shell a little shouldered, smooth, yellowish, with dark colored punctate dots in spiral series, about six series on the body whorl; lip a little thickened. Length, 1·5 mill.

Algiers.

Subsection MICROSETIA, Monts. 1884.

R. TURGIDA, Jeffreys. Pl. 69, fig. 29.

Rimate, thin, pellucid, very smooth, white or light yellowish, a little shining, the periphery with a spiral line, apex obtuse; whorls 5, convex, the last dilated, suture distinct. Length, 2·2 mill.

Northern Norway, New England; (487 fms.)

R. obtusispira, Seguenza, *R. oblita*, Tiberi, and *R. soluta*, var. *laevis*, Sars, are synonyms.

R. TUMIDULA, Sars. Pl. 69, fig. 30.

Rimate, thin, semipellucid, corneous, very lightly spirally striate, apex obtuse; whorls 4, convex, with deep suture. Length, 2·5 mill.

Arctic Norway.

R. ABJECTA, Watson. Pl. 69, fig. 31.

Subsolid, opaque, yellowish white, unicolored; whorls 5–8, somewhat flatly convex, suture thread-like, slightly channeled, surface very minutely spirally striate. Length, 2 mill.

Madeira.

R. FULGIDA, Adams. Pl. 69, fig. 33.

Scarcely rimate, rather thin, semipellucid, smooth, light yellowish, bifasciate with chestnut, penultimate whorl sometimes chestnut color; whorls 4, tumid, with deep suture. Length, 7 mill.

Europe.

It is *R. pygmaea*, Mich. Jeffreys has indicated a var. *pallida*.

R. FUSCA, Phil. Pl. 69, fig. 34.

Scarcely rimate, smooth, brownish, apex obtuse; whorls 4–4½, convex. Length, 1 mill.

Sicily.

R. inflata and *R. turriculata*, Monts., *R. paludinoides*, Calcara, are synonyms.

R. ALLERYANA, Arad. et Benoit. Pl. 69, fig. 35.

Scarcely umbilicated, thin, very smooth, pellucid, white; whorls 4, very convex, with deep suture; lip continuous, simple.

Length, 1 mill.

Sicily.

R. ambigua, Brugn., and var. *solidula*, Monts., are synonyms.

R. SCIUTIANA, Arad. et Benoit. Pl. 69, fig. 36.

Shell imperforate, smooth, vitreous, shining, yellowish chestnut, spire obtuse; whorls 5, convex, suture moderately impressed.

Length. ?

Sicily.

R. zancleana, Arad. (in tavola) is a synonym.

R. MICROMETRICA, Seguenza. Pl. 69, fig. 39.

Thin, smooth, subtransparent, yellowish, with three or four chestnut bands, suture deep; whorls 4, convex, the last subinflated, base narrowly rimate. Length, 1·25 mill.

Mediterranean Sea.

R. MARIÆ, Tenison Woods. Pl. 71, fig. 9.

Scarcely rimate, thin, translucent, smoky horn-colored, two-banded with yellow, polished; whorls 4, ventricose, sloping.

Length, 2·5 mill.

Tasmania.

R. ATKINSONI, Tenison Woods. Pl. 71, fig. 10.

Imperforate, but channeled, polished, translucent, pale horn color, obscurely bifasciate with dusky brown, columella black; normal whorls 5, well rounded; aperture produced below, lip thin, acute, columellar lip reflected into a false umbilicus. Length, 1 mill.

Tasmania.

R. POLYCHROMA, Folin. Pl. 70, fig. 63.

Smooth, a little shining, apex obtuse, scarcely longitudinally striate, with a very minute spiral thread on the periphery; whorls 5, the first two with very minute quadrangular impressions, reddish, yellowish or violaceous, or corneous white, with obscure darker bands; aperture subcircular, peristome simple, sharp.

Length, 1·7 mill.

Bay of Panama.

R. PULICARIA, Folin. Pl. 71, fig. 96.

Very smooth, shining, white, with a series of oblong chocolate spots on the periphery and spire, base with a dark band; whorls 5, subglobose, suture linear, scarcely impressed; aperture subcircular, lip simple. Length, 1·3 mill.

Mauritius.

R. BRAZIERI, Tenison Woods. Pl. 71, fig. 97.

Rimate, smooth, white, broadly banded with fulvous above the periphery, narrowly banded below it, under an olive epidermis; whorls 5, rounded, the last with sharply angulated periphery; lip sharp. Length, 3 mill.

Tasmania.

R. NITENS, Dunker. Pl. 71, fig. 100.

Umbilicated, smooth, shining, subpellucid, white, with two inconspicuous pale fulvous bands; whorls 4, convex, with incised suture, columella often violet tinted. Length, 1·4 mill.

Botany Bay, Australia.

R. ATROPURPUREA, Dunker. Pl. 71, fig. 1.

Umbilicated, smooth, pellucid, polished, dark purple; whorls 4, rapidly increasing, suture incised; lip subthickened.

Botany Bay and Sydney, Australia.

R. LIMBATA, Hutton. Pl. 71, fig. 98.

Narrowly umbilicated, polished, smooth; whorls flatly convex, the last with angulated periphery; pale olivaceous with zigzag white strigations, most apparent as a sutural and a peripheral band.

Length, 3 mill.

New Zealand.

Unfigured Species Referred to Microsetia.

R. MACILENTA, R. PUMILA, R. CŒLATA, Monts. *Mediterranean.*
R. OCHROLEUCA, and R. FICARATIENSIS, Brugnone. *Mediterranean.*

R. VEXILLATA, Brusina. *Mediterranean.*

R. Cossuræ, Calcara, *R. fasciata*, Requien and *R. Joenia*, Arad. and Benoit, are synonyms.

R. MESSANENSIS, Seguenza. *Mediterranean.*

Subsection CINGULINA, Monts. 1884.

R. CONCINNATA, Jeffreys. Pl. 69, fig. 32.

Imperforate, scarcely rimate, semipellucid, smooth, with remote, very slight incremental striæ, whitish, apex obtuse; whorls 4, convex, with deep suture; aperture nearly circular, outer lip thin.

Length, 1 mill.

Mediterranean Sea.

R. SOLUTA, Phil. Pl. 69, fig. 37.

Scarcely rimate, thin, very smooth; whorls 4, very convex, the last ventricose. Length, 1 mill.

Europe.

R. globosa, Martin, Ms. is a synonym.

Var. ALDERI, Jeffreys.

Somewhat larger and thinner, with a more produced and pointed spire.

Northern Europe.

R. MARIONENSIS, Watson. Pl. 70, fig. 65.

Thin, smooth, narrowly umbilicated, ruddy horny, apex blunt; whorls 5, slopingly flattened, slightly convex, with submargined, slightly impressed suture; lip sharp. Length, 1·85 mill.

Between Marion and Prince Edward Is.

R. PRINCIPIS, Watson. Pl. 70, fig. 66.

Imperforate, rather thick, more or less translucent, white, under a thin, caducous, yellowish epidermis; whorls 5, moderately convex, apex blunt, suture rather deep; lip sharp, patulous.

Length, 2 mill.

Between Marion and Prince Edward Is.

R. AUSTRALIS, Watson. Pl. 70, fig. 67.

Imperforate, thin, smooth, pale horn color, under a thin yellowish epidermis; whorls 5, moderately convex, with slightly impressed suture; lip sharp. Length, 1·85 mill.

Royal Sound, Kerguelen Is.

R. PHILOMELÆ, Watson. Pl. 70, fig. 68.

Minutely rimate, subhyaline, white, shining, apex obtuse; whorls scarcely 5, convexly conical, suture not deep, slightly margined; outer lip sharp, a little patulous below. Length, 1·45 mill.

Off Nightingale Isl., Tristan da Cunha.

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R. QUISQUILIARUM, Watson. Pl. 70, fig. 69.

Imperforate, solid, smooth, except a few distant spiral striæ on the base, apex obtuse; whorls 5, convexly conical, suture slightly impressed; lip with a varix. Length, 1·5 mill.

Off Fayal, Azores; 450–500 fms.

R. EDWARDIENSIS, Watson. Pl. 70, fig. 70.

Minutely rimate, rather thick, dull, smooth, ruddy horn color, becoming whitish towards the mouth; whorls 4½, convex, the last tumid; outer lip thin, slightly patulous. Length, 0·75 mill.

Off Prince Edward Isl.; 50–150 fms.

R. SINAPI, Watson. Pl. 70, fig. 71.

Imperforate, rather strong, smooth, reddish horn-color, with blunt apex; whorls 4, rapidly enlarging, convex, suture linear; lip thin. Length, 1 mill.

Royal Sound, Kerguelen Isl.

R. TRIANGULARIS, Watson. Pl. 70, fig. 72.

Umbilicated, smooth, white, apex blunt, suture impressed; whorls 4½, rapidly increasing, convex, base with an angle round the umbilicus; lip thin, slightly patulous. Length, 1 mill.

Ascension Isl.; 420 fms.

R. APICINA, Verrill. Pl. 71, fig. 85.

Narrowly umbilicated, with acute, substyliform apex, striated by growth-lines, smooth, dark brown; nuclear whorls 4, normal whorls 5, convex, suture deeply impressed, last whorl with an indistinct ridge below the periphery. Length, 7·6 mill.

Off New England Coast; 1608 fms.

The animal has rather short, stout, tapering tentacles, and is apparently without eyes.

R. LATIOR, Mighels and Adams. Pl. 71, fig. 92.

Narrowly umbilicated, smooth, pale horn-color, with deep suture; whorls 4, convex, rapidly enlarging; aperture rounded, inner margin with a lamina. Length, 2 mill.

New England.

I am inclined to include in this species *R. robusta*, H. C. Lea, of which a single specimen was obtained at Cape May, N. J.

R. KERGUELENI, Smith. Pl. 71, fig. 3.

Imperforate, thin, vitreous or milk white, light brownish at the apex, polished; whorls 6, convex, apex obtuse, suture very narrowly margined; lip continuous, slightly thickened and expanded. Length, 3 mill.

Kerguelen's Land.

R. NIGRA, Krauss. Pl. 71, fig. 4.

Imperforate, thin, rather smooth, violaceous or greenish black, apex obtuse; whorls 5, convex, with deep suture; lip acute, simple. Length, 1·4 mill.

Algoa Bay, So. Africa.

R. LITTORINIFORMIS, Garrett. Pl. 71, fig. 5.

Smooth, pellucid, shining, white; whorls 5½, very convex, rapidly increasing, suture deeply impressed, slightly margined; peristome rather thick. Length, 2 mill.

Viti Is.

R. HYALINA, Garrett. Pl. 71, fig. 91.

Thin, hyaline, shining, white; whorls 6–7, convex, with very fine, crowded, spiral raised striæ, crossed by more delicate growth lines; whorls 6–7, convex, with deep suture; peristome rather thick, simple, slightly expanded at the base. Length, 6 mill.

Samoa, Viti and Paumotus Is.

R. MELANURA, Tenison Woods. Pl. 71, fig. 7.

Scarcely perforate, solid, somewhat translucent, smooth, shining, suture impressed, dark olivaceous; whorls 5, slightly convex, periphery obtusely angulated; aperture anteriorly produced, lip simple. Length, 2 mill.

Tasmania.

R. ANGELI, Tenison Woods. Pl. 71, fig. 11.

Umbilicated, turbinate conoidal, thin, pellucid, yellowish, with rather sharp crowded growth lines, and thin, slight spiral striæ; whorls 5, with well-impressed suture; aperture rounded, lip thickened. Length, 1·5 mill.

Tasmania.

R. CORIACEA, Manzoni. Pl. 69, fig. 54.

Scarcely rimate, thin, fragile, coriaceous, longitudinally lamellarly striate, light yellowish brown; whorls 6, convex, with deep slightly margined, channeled suture, and rapidly increasing; lip thin, simple. Length, 2·6 mill.

Madeiran Archipelago.

An abberant form.

Subsection PARVISETIA, Monts. 1884.

R. SCILLÆ, Seguenza. Pl. 69, fig. 38.

Translucent, opaline, very smooth, shining, yellowish, sometimes with darker maculations or streaks; whorls 4, convex, the last

whorl inflated, apex obtuse; aperture nearly round, with simple, slightly thickened lip.

Sicily.

The spire outline more convex than in the preceding species.

R. brutia, Tiberi, Ms. has been quoted as a synonym.

R. TIBERIANA, Issel. Pl. 71, fig. 90.

Rimate, pellucid, whitish or yellowish, shining, very slightly longitudinally striulate; whorls 4½, convex, suture impressed, obscurely margined; peristome a little thickened, continuous.

Length, 1·5 mill.

Suez.

R. GLOBULUS, Möller. Pl. 70, fig. 64.

Whorls rapidly enlarging, convex, with deep suture, apex obtuse, hyaline, whitish or yellowish, shining, smooth. Length, 2·5 mill.

Norway, Spitzbergen, Greenland, Gulf of St. Lawrence.

R. GLOBULINA, Monts. (unfigured.) *Sicily.*

Unfigured Species of Setia.

R. PATENS, Gould. *Charleston Harbor, S. C.*
R. TRICINCTA, R. CANDIDA, R. BIFASCIATA, A. Ad. *Japan.*
R. FLAMIA, Beddome. *Tasmania.*
R. BIZONATA, Nevill. *Mauritius.*
R. SIENNÆ, Tenison Woods. = *Hydrobiidæ.*
R. TORCULARIS, Tenison Woods. *Port Jackson, Australia.*
R. GRIEGI, Friele. (Figure inaccessible to me.) *Arctic Seas.*

Subgenus RISSOPSIS, Garrett. 1873.

R. TYPICA, Garrett. Pl. 69, fig. 52.

Thin, hyaline, smooth, glossy, white; whorls 6, flat, suture faintly impressed, margined; peristome rather thin, sinuous, somewhat expanded, columella obliquely arched, slightly callous.

Length, 10 mill.

Viti and Samoa Is.

Subgenus ALVANIA, Risso. 1826.

R. CIMEX, Linn. Pl. 65, figs. 11, 12.

Imperforate, strong, opaque, covered by rounded granules in longitudinal and spiral series, white or light fulvous to chestnut

color, unicolored or bifasciate; lip thick, labiate and sulcate within, white-varicose externally. Length, 6 mill.

Mediterranean Sea.

The synonyms are *R. calathiscus*, Mtg., *R. Boryanus*, Chiaje, *R. cancellata*, Desm., *R. Europea*, Risso, *R. Fremenvillei* and *R. mamillata*, Risso, *R. granulata*, Phil., and vars. *paupercula*, and *depauperata*, Monts.

R. MONTAGUI, Payr. Pl. 65, fig. 15.

Imperforate, thick, spirally lirate, longitudinally strongly ribbed, whitish, yellowish or chestnut color, plain or with one or two bands; whorls 5, suture distinct, subchanneled; aperture white-lipped and sulcate within, with white varix externally. Length, 5 mill.

Mediterranean Sea.

The most striking difference between this and the preceding species is in the prominence of the longitudinal over the spiral sculpture. The synonyms are *R. Sardoa*, Risso, *R. Nicolosiana*, Arad. and Benoit, *R. buccinoides*, Desh. (in part), and *R. Schwarziana*, Brus.

R. CANARIENSIS, d'Orb. Pl. 65, fig. 32.

Imperforate, solid, white, covered with rounded nodules by the intersection of longitudinal and spiral ribs; whorls 5, slightly convex, with rather deep suture, lip thickened and margined.

Length, 1·75 mill.

Madeira, Canary Is., Algiers, Palermo.

R. CALATHUS, Forbes and Hanley. Pl. 65, fig. 30.

Like the last species, but more conical, more rudely sculptured, the longitudinal sculpture more prominent. Length, 4 mill.

Europe.

R. LINEATA, Risso. Pl. 64, figs. 1, 3; Pl. 65, figs. 13, 29.

With strong ribs, becoming obsolete on the base, and numerous spiral liræ, yellowish or fulvous, the liræ forming lines of deeper color; whorls 6, convex, with deep suture; lip thickened externally, plicate within. Length, 4 mill.

Mediterranean Sea.

R. rugulosa, Arad., *R. coronata*, Brusina, *R. lignea* (Thorpe?) Reeve (fig 13), var. *costulosa*, Risso, and *R. Peloritana*, Arad. et Benoit. (fig. 3), are synonyms.

Var. ASPERA, Phil. Fig. 29.

Decussations deeper, giving the nodules a rough appearance.

It is *R. variegata*, Danilo and Sandri, and *R. costulosa*, Schwartz.

R. AREOLATA, Stimpson. Pl. 68, fig. 83.

Clathrate by rather distant, narrow longitudinal and spiral ribs; whorls 7, convex, with deep suture; lip simple. Length, 3·5 mill.

New England.

R. ACUTELIRATA, Carp. Pl. 66, fig. 41.

Thin, brownish ash-color, with about 18 longitudinal, distant ribs, vanishing on the periphery, crossed by distant spiral liræ (15 on last whorl), not nodose; whorls 6, rapidly enlarging, convex, with well-impressed suture. Length, 2·25 mill.

San Diego, Cal.

R. LANCLÆ, Calcara. Pl. 63, fig. 83.

Yellowish, orange brown or yellowish white; longitudinally distantly costate, spirally lirate, forming nodules on the ribs, base without ribs, but spirally striate; whorls 5–6, very convex, suture deep, channeled; lip externally thickened. Length, 4 mill.

Mediterranean Sea.

R. scabra, Monts., and *R. Schwartzii*, Benoit, are synonyms.

R. RETICULATA, Mtg. Pl. 65, fig. 9.

Imperforate, solid, almost opaque, yellowish or yellowish brown, sometimes indistinctly bifasciate, reticulated by numerous, curved, narrow ribs, and very distinct spiral liræ; whorls 6–7, slightly convex, suture narrowly excavated; lip plicate within, with a striated external varix. Length, 4 mill.

Europe.

The synonymy includes *R. textilis*, Phil., *R. Brocchii*, Weink., *R. Beanii*, Forbes and Hanley.

R. FISCHERI, Jeffreys. Pl. 65, fig. 31.

Imperforate, opaque, not shining, reticulated by equal, narrow, distant longitudinal and spiral riblets, light yellowish or whitish; whorls 5, moderately convex, with deep suture; lip rather thin, not varicose, smooth within. Length, 2·5 mill.

Mediterranean Sea, Portugal.

R. JEFFREYSI, Waller. Pl. 66, fig. 56.

Whitish or fulvous, with prominent spiral liræ, decussated by less elevated longitudinal sculpture, which becomes obsolete on the base; whorls 5, convex, subangulate, suture deep, channeled; lip scarcely varicose. Length, 3·5 mill.

North Sea, Mediterranean.

It is *R. sororcula*, Granata.

R. TARSODES, Watson. Pl. 67, fig. 77.

Scarcely rimate, white, with about 20 narrow ribs, fading below the periphery, clathrate by distant, spiral liræ, extending feebly over the base; whorls 5, convex, slightly shouldered, with deep suture; lip feebly varicose. Length, 1·87 mill.

Off Fayal, Azores; 450–500 fms.

R. DIDYMA, Watson. Pl. 67, fig. 76.

Scarcely rimate, strong, dull yellowish, with about 12 strong, narrow, distant longitudinal ribs, fading below the periphery, nodulously clathrate by equal, distant, spiral ribs, with three smaller, closer ones on the base; whorls 5½, with deep suture; lip very thick, subduplicate. Length, 2·15 mill.

Near Culebra and St. Thomas, W. I.; 390 fms.

R. CIMICOIDES, Forbes. Pl. 65, fig. 27.

Solid, opaque, yellowish or fulvous brown, sometimes bifasciate, with rather broad longitudinal riblets, vanishing below, crossed by spiral unduluting liræ, forming intersectional nodules; whorls 7–8, somewhat flattened in the middle, the last dilated, suture channeled; lip varicose. Length, 5·5 mill.

Mediterranean Sea to Norway.

It is *R. sculpta*, Forbes and Hanley, *R. intermedia*, Aradas.

R. GERGONIA, Chiereg. Pl. 65, fig. 10.

Solid, fulvous, strongly tuberculated by longitudinal ribs crossed by spiral liræ, the subsutural series strongest and largest; whorls 6, slightly convex, suture not deep; lip plicate within, externally varicose. Length, 3·5 mill.

Mediterranean Sea.

R. Mariæ, Bucq. Dautz. Doll. (not Orb.), is a synonym.

R. LUSCINIÆ, Watson. Pl. 67, fig. 79.

Imperforate, glossy, yellowish white, with about 16, low, rounded, distant ribs, nearly obsolete on the last whorl, crossed by rather closer, equally strong, revolving ribs, which continue to the base, intersections slightly nodulous; whorls 5, convex, with deep suture; lip varicose. Length, 2·25 mill.

Nightingale Isl., off Tristan da Cunha; 100 to 150 fms.

R. SUBCRENULATA, Schwartz. Pl. 64, fig. 2.

Rather solid, shining, subhyaline, white, with strong longitudinal ribs and scarcely smaller spiral liræ, the intersections distinctly

tuberculated; lip prominently, denticulately varicose externally.

Length, 3 mill.

Mediterranean Sea.

It is *R. Oceani*, Arad. and Benoit, *R. granulata*, Requien, and *R. crenulata*, Var. *minor*, Phil.

R. SCABRA, Phil. Pl. 63, fig. 84.

Longitudinally plicate, obsolete below, spirally lirate, forming mamillary tubercles; whorls 6, slightly convex; white, maculated with chestnut; lip sulcate within, varicose externally.

Length, 3 mill.

Sicily.

It is *R. mutabilis*, Schwartz. Ms.

R. HISPIDULA, Monts. Pl. 66, fig. 38.

Rather solid, brownish, regularly clathrate by longitudinal narrow riblets and more numerous spiral liræ; lip plicate within, externally dentately varicose; whorls 6, moderately convex.

Length, 3·75 mill.

Mediterranean Sea.

It is *R. clathrata*, Phil.

R. SUBAREOLATA, Monts. Pl. 65, fig. 25.

Imperforate, translucent, brownish, subclathrate by longitudinal riblets crossed by spiral liræ; whorls 5, convex, with deep suture; columella arcuate, basal area cingulate, lip thickened externally.

Length, 3 mill.

Sicily and Algiers.

It is *R. Caribœa*, Monts. *R. costulata*, S. Wood. *R. Stefanisi*, Jeffreys.

R. LEACOCKI, Watson. Pl. 65, figs. 33, 34.

Minutely rimate, solid, translucent, yellowish white, with two chestnut bands, white between them, with 15–18 strong oblique ribs, and equally strong spiral ribs, forming rather large, close nodules; whorls 5–6, somewhat conically flattened, suture distinct; lip varicose. Length, 2·6 mill.

Madeira.

R. CARIBÆA, d'Orb. Pl. 66, fig. 57.

Shell imperforate, thick, white, with two chestnut bands, strongly, closely nodulous, with spiral ribs at the base; whorls 5, convex, with rather narrow suture; lip thick. Length, 2 mill.

West Indies.

Closely related to the preceding species. *R. corilea*, d'Orb. of Reeve's Icon. is a misprint for this species.

R. INTERFOSSA, Nevill. Pl. 66, fig. 50.

Somewhat solid, light fulvous, with three spiral rows of granules on the penultimate, five on the last whorl, and two spiral ribs at the base; whorls 6, somewhat shouldered, with deep suture; lip thickened. Length, 2 mill.

Indian Ocean.

R. ELEGANS, Angas. Pl. 66, fig. 46.

Imperforate, rather solid, whitish, closely nodose, in three (on the last whorl four) spiral series; whorls 5, angularly convex, with deep suture; lip varicose. Length, 2·5 mill.

Port Jackson, Australia.

R. GRACILIS, Angas. Pl. 66, figs. 47.

Imperforate, moderately solid, light purplish brown; whorls 5, convex, ribbed as far as the periphery of the last whorl, strongly spirally lirate throughout, intersections beaded; peristome thickened. Length, 2·5 mill.

Port Jackson, Australia.

R. STIGMATICA Frauenf. Pl. 66, fig. 42.

Imperforate, thick, subpellucid, white, with 16–17, longitudinal, rather close, rounded ribs, crossed by spiral liræ—which continue to the base, whilst the former there become obsolete; whorls 5½, flattened convex, with moderate suture; lip varicose.

Length, 2 mill.

Kamorta, Nicobar Is.

R. FENESTRATA, Krauss. Pl. 66, fig. 40.

Imperforate, white, clathrate by distant longitudinal and spiral narrow ribs; whorls 7, convex, rapidly enlarging, with deep suture; lip with about 15 minute internal teeth. Length, 3 mill.

Cape of Good Hope; on byssus of Pinna.

R. CRYSTALLINA, Garrett. Pl. 63, fig. 78.

Shell thin, subpellucid, shining, vitreous, white, with small, flexuously oblique, distant longitudinal ribs, evanescent below, and close spiral liræ; whorls 5, convex, with deep suture, lip thickened. Length, 2 mill.

Viti Isles.

Unfigured Species of Alvania.

R. CARPENTERI, Weink. *Vancouver's Isl.*
Is *R. reticulata*, Carp. (not Montagu).
R. FILOSA, Carp. *Vancouver's Isl.*
R. PURPUREA, Dall. *Monterey, Cal.*
R. PERLATA, Mörch. *West Coast Central America.*
R. AEMULA, Monts. *Messina, Sicily.*
R. MARIONÆ, Monts. *Toulon, France.*
R. BADIA, R. CIRCINNATA, R. CLATHRATULA, R. CONCINNA, R. FERRUGINEA, R. MARIELLA, R. SCITULA, R. SEMICOSTATA, R. TIARULA, all of A. Adams. *Japan.*
R. FASCIATA, Tenison Woods. *Tasmania.*
R. FUSCA, R. FENESTRATA, R. GUADRATA, Gould. *China Sea.*
R. ACUMINATA, Gould. *Bonin Is.*
R. PURA, Gould. *Simoda, Japan.*
R. BAYNTONI, Beddome. *Tasmania.*

Section ACINOPSIS, Monts. 1884.

R. CRENULATA, Mich. Pl. 65, fig. 14.

Imperforate, solid, opaque, yellowish white, tinted and indistinctly bifasciate with chestnut, spire mucronate; longitudinally broadly ribbed, strongly spirally lirate, the intersections forming strong rounded tubercles; whorls 6–7, convex, the suture widely channeled; aperture expanded, brownish red and sulcate within, subcanaliculate below, lip crenulately varicose exteriorly, columella tuberculated anteriorly. Length, 5 mill.

Europe.

It is *R. cimex*, Donovan, *R. cancellata* (Da Costa?) Jeffreys, and *R. verrucosa*, Risso.

R. HIRTA, Monts. Unfigured. *Mediterranean Sea.*

Section MASSOTIA, Bucq. Dautz. Dollf. 1884.

R. LACTEA, Mich. Pl. 66, fig. 51.

Thin, subtranslucid to opaque, feebly longitudinally and spirally closely costellate, yellowish white or white; whorls 5–6, subconvex, with linear suture, lip scarcely thickened externally.

Length, 6 mill.

Mediterranean Sea, Portugal.

R. cancellata, Petit is a synonym.

Section NEVILLIA, A. Ad. 1868.

R. PICTA, H. Adams. Pl. 66, fig. 53.

Imperforate, rather solid, with unequal spiral ribs, of which the one on the middle of each whorl is strongest, and minutely longitudinally striate; whitish, maculated with chestnut; whorls 5½, angulated, with distinct suture; columella callous, with an anterior tooth, lip acute, smooth within, varicose externally.

Length, 2·25 mill.

Mauritius.

R. LUCIDA, H. Adams. Pl. 66, fig. 54.

Rather solid, imperforate, subpellucid, white, with subdistant spiral riblets, and very minute longitudinal striæ; whorls 5, convex, with impressed suture; columellar tooth and external varix strong.

Length, 2 mill.

Mauritius, Isle of Bourbon.

Section ALVINIA, Monts. 1884.

R. WEINKAUFFI, Schwartz. Pl. 66, fig. 48.

Imperforate, thin, subpellucid, a little shining, whitish or yellowish, clathrate by longitudinal riblets, and much stronger, distant spiral ridges; whorls 6, convex, angulated, shouldered, with deeply incised suture; aperture smooth within, slightly varicose externally.

Length, 3 mill.

Sicily and Algiers.

R. dictyophora, Weink. is a synonym.

R. DICTYOPHORA, Phil. Pl. 66, fig. 49.

Thin, hyaline, dark brown or fulvous, with distant thin longitudinal, and stronger, more distant spiral liræ, two of the latter in the penultimate and five in the last whorl; perforate; lip thin.

Length, 2 mill.

Sicily.

R. PAGODULA, Bucq. Dautz., Dollf. Pl. 66, fig. 55.

Imperforate, rather solid, turrited, longitudinally ribbed, spirally strongly ridged, the upper ones forming tubercles; whorls 6, subcarinate, shouldered, suture deep; aperture margined. Length, 2 mill.

Mediterranean Sea.

It is *R. Philippiana* and Var. *bivittata*, Jeffreys, *R. scabriuscula*, Req. *R. Lanciæ*, Mts. and *R. tessellata*, Schwartz.

R. CHEILOSTOMA, Tenison-Woods. Pl. 68, fig. 91.

Imperforate, solid, dull, yellowish, clathrate by longitudinal and spiral ribs, the former vanishing about the periphery, the latter

continued, and more conspicuous on the base; whorls 7, with deep, lirate suture, aperture conspicuously bilabiate. Length, 3 mill.

Tasmania.

R. MAURITIANA, Martens. Pl. 66, fig. 35.

Rather thick, white, strongly, rather closely, longitudinally ribbed throughout, crossed by spiral ridges, forming spiral series of nodules, of which there are two on the penultimate and five or six on the last whorls; whorls 4½, convex; peristome thickened, simple.

Length, 1·5 mill.

Mauritius.

R. VENUSTA, Garrett. Pl. 68, fig. 90.

Shell imperforate, solid, vitreous, shining, white, with strong compressed spiral ridges, of which there are 5 on the body whorl and 2 on the spire, crenulated by close, less conspicuous, longitudinal, rounded riblets; whorls about 7, convex, with deep, margined suture; lip very thick, varicose. Length, 3·5 mill.

Viti Is.

Section GALEODINA, Monts. 1884.

R. STRIATULA, Montagu. Pl. 66, fig. 58.

Rather solid, opaque, yellowish white, thinly longitudinally striate in the interstices between much stronger spiral ridges, which carinate and shoulder the whorls; aperture a little dilated below, smooth within, ridged-varicose externally. Length, 4·5 mill.

Europe.

R. Russinoniaca, Locard, *R. labiata*, Phil. *R. trochlea*, Mich., and *R. carinata*, Da Costa. are synonyms.

R. CONSOCIELLA, and R. ELECTA, Mts. (Unfigured). *Mediterranean.*

Section THAPSIELLA, Fischer. 1884.

R. RUDIS, Phil. Pl. 66, fig. 59.

Hyaline, sometimes faintly strigate with chestnut, spirally striate, spire and upper part of body whorl longitudinally, rather faintly costate; whorls 6½, somewhat convex; lip simple, plain within and without. Length, 2·6 mill.

Mediterranean Sea.

P. FREMENVILLEI, Audouin. Pl. 67, fig. 66.

Imperforate, shining, white, with longitudinal subdistant ribs, fading out on upper part of body whorl, closely spirally striate

throughout; whorls 7, convex, with deep suture; lip simple, continuous.

Suez.

Section ACTONIA, Monts. 1884.

R. TESTÆ, Arad. and Maggiore. Pl. 66, figs. 60, 61.

Somewhat solid, transparent, whitish, with distant thin plicæ, vanishing towards the base, subcancellated by less elevated, distant, spiral liræ; whorls 6, somewhat convex, with deep suture; aperture effuse below, lip acute, smooth within, externally varicose.

Length, 3–4 mill.

Norway to Mediterranean; deep sea.

R. abyssicola, Var. *coniformis*, and *R. asperula*, Brugn. are synonyms.

Var. ABYSSICOLA, Jeffreys. Fig. 61.

Shorter, sculpture less distinct.

R. SUBSOLUTA, Aradas. Pl. 66, fig. 62.

Somewhat solid, white or brownish, opaline, thinly, rather numerously longitudinally costulate, riblets vanishing on lower part of body whorl, with less prominent, close, spiral striæ, stronger at the base; whorls 5, convex, with deep suture; aperture expanded below, externally varicose. Length, 2 mill.

Europe, abyssal.

It is *R. elegantissima*, and Var. *major*, Seguenza, *R. abyssicola*, Var. *obtusa*, Jeffreys. and *R. abyssicola*, Sars.

Unfigured doubtful and spurious species described as Rissoæ.

R. PULCHELLA, R. LINEATA, R. LAYARDI, R. APPROXIMATA, R. DUBIA, R. DIEMENENSIS, R. BICOLOR, and R. BADIA, Petterd. *Tasmania.*

R. AGNEWI, Tenison Woods. *Tasmania.*

R. GRACILIS, A. Ad. *Suez.*

R. (GONIOSTOMA) procera, A. Ad. *Gulf of Pechili, China.*

R. (GONIOSTOMA) pupiformis, A. Ad. *Japan.*

The section Gomiostoma has neither been described nor figured.

R. PAPUANA, Tapparone-Canefri. *Papuan Is.*

R. BELLA, R. ELEGANS, A. Ad. *Philippines.*

R. ARATA, R. RUFA, R. SOLIDULA, Phil. *Guinea, W. Africa.*

R. UMBILICATA, Phil. *China.*

R. Schythei, Phil. *Sts. of Magellan.*
R. lævigata, R. mucronata, R. tuberculata, R. truncata, Menke, R. scrobiculata, Möll. *Greenland.*
R. gradatula, R. emaciata, Mörch. *West Indies.*
R. crassicosta, R. eulimoides, R. aberrans, A. Ad. *Jamaica.*
R. incompta, Gould. *Florida.*
R. Gentilissiana, Sowb. (Pl. 68, fig. 5).
= *Hydrobia Gentilsiana*, Crosse.
R. bicingulata, and R. tenuicostata, Seguenza. *Messina.*
R. Boscii, Payr. *Corsica.*
R. punctum, Cantraine. *Mediterranean.*
R. Weyville-Thompsoni, Jeffreys. *Arctic Ocean.*
R. pedicularis, Menke. *Heligoland.*
R. præusta, Recluz. *Toulon.*
R. substriata, and R. exigua, Phil. *Sicily.*
R. dilecta, Monts. *Sicily.*
R. scalaris, Mich. = *Truncatella.*
R. Gougeti, Mich. *Senegal.*
R. elongata, R. excavata, Phil. = *Odostomia.*
R. eximia, Jeffreys. = *Odostomia.*
R. Cooperi, Tryon. = *Amnicolidæ.*

Genus RISSOINA, d'Orb. 1840.

Section Rissoina (sensu stricto).

R. Inca, d'Orb. Pl. 55, fig. 15.

Strong, stout, with about 17 elevated, suboblique, flexuous, longitudinal ribs, and fine spiral striæ, more prominent on the base; whorls 7–8, nearly flat, suture crenulated; rosy white.

Length 8·2 mill.

Bolivia, Peru.

R. pyramidalis, A. Ad. Pl. 55 fig. 16.

Solid, dirty white, longitudinally obliquely plicate, spirally striate, whorls 8, flattened, suture crenulated. Length, 8·5 mill.

Philippines.

R. assimilis, Jickeli. Pl. 68, fig. 15.

Shell solid, white, with 10–11, straight, narrow, longitudinal costæ, and much wider interstices, which show slight, distinct spiral striæ; whorls 8, slightly convex, with impressed suture; lip scarcely varicose. Length, 8·3 mill.

Red Sea.

R. CONIFERA, Schwartz. Pl. 55, fig. 30.

Somewhat solid, subpellucid, shining, white, with 12–14 rounded, subdistant, straight longitudinal ribs, the interstices closely spirally striated below; whorls 6–7, turrited, suture crenulated; lip varicose.

Length, 5·4 mill.

Mauritius.

Described by Schwartz and referred to *R. conifera*, Montagu, a lost species which is more likely to have been a *R. Bruguieri*. Weinkauff erroneously quotes it as *R. coniformis* and gives it the new name *R. Montagui*.

R. FASCIATA, A. Ad. Pl. 55, figs. 17, 18.

Solid, chestnut color, with a central pale band, distantly obliquely, subflexuously plicate, closely spirally striate; whorls 8, somewhat convex, with impressed, crenulated suture. Length, 6·8 mill.

Sydney, Australia.

R. Smithii, Angas, (fig. 18) is a synonym.

R. BRUGUIERI, Payr. Pl. 55, figs. 19, 22.

Solid, white or yellowish white, with about 16 flexuous, longitudinal plicæ, crossed by strong spiral striæ; whorls 7–8, a little convex, suture plane, somewhat undulated; varix ridged.

Length, 7·6 mill.

Mediterranean Sea.

R. Poliana and *R. reticulata*, Risso, and *R. decussata*, Menke are synonyms; and *R. striolata*, Risso (fig. 22) may probably be added.

R. HANLEYI, Schwartz. Pl. 55, fig. 21.

Strong, shining, milk white, with two orange-brown bands, with 22–24, close, subsinuous, low, longitudinal plications, and close, numerous spiral striæ, the sculpture evanescent on lower part of body whorl; whorls 7, slightly convex, with impressed suture; lip thickened, scarcely varicose. Length, 7·3 mill.

Philippines; *Sydney, Australia.*

R. VARIEGATA, Angas. Pl. 56, figs. 43–46.

Varies greatly in coloring as well as in the development of its sculpture. I think that the figures which I have copied from the Conch. Icon. are from worn specimens, as they do not exhibit the sculpture to the same extent as Angas' originals, the description of this species is not unlike that of *R. Hanleyi*, and it will probably prove identical with it.

Sydney, Australia.

R. MONILIS, A. Ad. Pl. 55, fig. 23.

Solid, light fulvous, with a sutural row of nodules, and close, narrow, longitudinal plications, the interstices spirally punctate-striate; whorls 7, flattened; varix striate. Length, 4·9 mill.

Philippines.

R. KREBSI, Mörch. Pl. 54, fig. 7.

Semipellucid, white, with about 28 thin, subsinuous, longitudinal riblets, cut into a row of tubercles just below the suture, decussated by spiral, close striæ; whorls 7, convex, with slightly impressed suture; lip varicose. Length, 3·5 mill.

Cuba, Jamaica.

Schwartz has described and figured this as *R. multicostata*, Ads.

R. MICANS, A. Ad. Pl. 55, fig. 28.

Rather solid, white, shining, subdistantly, elevately plicate, interstices spirally striate, last whorl sulcate below; whorls 9, convex; lip varicose. Length, 4·7 mill.

Philippines.

R. FORTIS, C. B. Ad. Pl. 55, fig. 25.

White, with 22 rather strong, rounded, nearly straight, longitudinal ribs; whorls 10, somewhat turreted, flattened, with crenulated, rather deep suture; lip strongly varicose. Length, 7·4 mill.

Panama to *Cape St. Lucas.*

R. STRICTA, Menke. Pl. 55, fig. 26.

White, densely, smoothly longitudinally costate, the interstices obsoletely spirally striate; whorls 7, flattened. Length, 7 mill.

Mazatlan.

Very closely allied to the preceding species, if not identical with it.

R. AMBIGUA, Gould. Pl. 55, figs. 31, 27, 29, 35; Pl. 54, fig. 7.

Whitish, with about 20 narrow, small, longitudinal plications, often becoming faint on the last whorl, closely spirally striate; whorls about 10, flatly convex, with impressed suture; lip varicose. Length, 7·3 mill.

Aden, Ceylon, Singapore, Paumotus, Sandwich Isl., Mauritius, Viti Is., etc.

It is *R. pusilla*, Schwartz, not Brocchi (fig. 27), *R. cincta*, Dunker, *R. myosoroides*, Recluz (fig. 29), *R. striolata*, Dunker, *R. multicostata*, Garrett (fig. 9) *R. costulifera*, Pease, *R. subconcinna*, Souverb. (fig. 35) and var. *perpusilla*, Nevill.

R. Woodwardi, Carp. Pl. 56, fig. 72.

Whitish, with 12–14, narrow plicæ, and wider interstices, which are longitudinally, not spirally striated; whorls 7–8, subplanate, suture impressed. Length, 3 mill.

Mazatlan.

The unfigured *R. clandestina*, C. B. Ad. has been referred here; if identical, it will take precedence.

R. costulata, Pease. Pl. 55, fig. 32.

White, with a central chestnut band, prominently longitudinally ribbed, spirally striate; whorls plano-convex, with channeled suture. Length, 5 mill.

Paumotus Is.

R. incerta, Souverb. Pl. 55, figs. 34, 33.

Solid, subulate, white, with or without a spiral chestnut band, obliquely, strongly, longitudinally 12–13 ribbed, interstices with crowded spiral striæ, most conspicuous anteriorly; whorls 10, slightly convex, with deep suture; lip strongly varicose. Length, 8·5 mill.

New Caledonia, Viti and Samoa Is.

The latter localities are for *R. terebra*, Garrett, (fig. 33) which appears to be identical.

R. debilis, Garrett. Pl. 56, fig. 48.

White, with small slightly oblique, rounded ribs, fading anteriorly, interstices finely striate spirally, the striæ continuous and more distinct on lower part of body whorl; whorls 8, convex, with deep suture; peristome varicose externally. Length, 4·5 mill.

Viti Is.

R. Nevilliana, Weink. Pl. 55, figs. 37, 38.

Whitish, indistinctly yellow banded, somewhat shining, with strong, longitudinal, unequal costæ, and very light spiral striæ; whorls more than 8, angulated, with very deep suture; lip subvaricose. Length, 13 mill.

Near Hong Kong, China.

R. Gertrudæ, Tenison Woods. Pl. 55, fig. 39.

Rather thin, translucent, milk-white, with small, rounded, subobsolete longitudinal plicæ, slightly spirally striate towards the base; whorls 8, somewhat convex, suture broadly margined; lip dilated in the middle, thickened; base rimate. Length, 4·5 mill.

King's Island, Tasmania.

R. SPIRALIS, Souverb. Pl. 55, fig. 40.

Whitish, longitudinally costate, with equal interstices which are slightly spirally striate, base of body-whorl decussated by spiral sulcations; whorls 9, slightly convex, with impressed suture; lip continuous, externally thickened. Length, 5 mill.

New Caledonia.

R. COSTATOGRANOSA, Garrett. Pl. 55, fig. 41.

Solid, shining, ashy white, longitudinally closely, somewhat obliquely flexuously, granosely ribbed, spirally closely grooved; whorls 9, convex, with deep suture; lip thick, finely crenulated, somewhat dilated. Length, 5 mill.

Viti Isles.

R. TRIANGULARIS, Watson. Pl. 54, fig. 12.

White, with 12–13, low, distant, oblique, flexuous longitudinal ribs, and much wider shallow furrows, narrowly spirally striate throughout; whorls 8, convex; pillar lip long, oblique, outer lip varicose, aperture expanded below. Length, 3·75 mill.

Cape York, N. E. Australia.

R. GRACILIS, Garrett. Pl. 55, fig. 42.

Rather thick, somewhat shining, light brown, with rather large, closely set, slightly oblique longitudinal ribs and equal interspaces, ribs flexuous on lower part of body whorl; whorls 9, flatly convex, with margined suture; lip thick, sinuous above and below.

Length, 3 mill.

Viti and Society Is.

R. TEREBROIDES, E. A. Smith. Pl. 54, fig. 6.

Whitish, with a median chestnut zone, with 11–12 arcuate, strong, longitudinal costæ, very minutely spirally striate, ribs fading below; where the striæ are stronger, whorls about 10, moderately convex; lip broadly, strongly varicose. Length, 8·5 mill.

San Christoval, Solomon Is.

R. LIRATA, Angas. Pl. 54, fig. 10.

Rather thin, dull milky white, with regular, thin, flexuous longitudinal ribs, becoming obsolete below, where numerous, very fine, close-set spiral striæ are visible; whorls 7, slightly convex; outer lip thickened, varicose. Length, 4 mill.

So. Australia.

R. HONOLULUENSIS, Watson. Pl. 54, fig. 13.

White, with 15 subcontinuous, narrow, straight longitudinal ribs, and much wider interspaces, finely, microscopically spirally striate,

striæ more distinct on the base; whorls 6, besides the embryonic, flatly convex; lip thick, externally varicose. Length, 3·5 mill.

Sandwich Islands.

R. SUBVILLICA, Weinkauff. Pl. 56, fig. 54; Pl. 68, fig. 100.

Whitish, with strong, rounded longitudinal ribs, replaced by spiral riblets below the middle of the body whorl; whorls 11, swollen, turreted. Length, 15 mill.

Loochoo Is.

Figured in Conch. Icon. as *R. villica*, Gould, (fig. 100).

R. COSTULATA, Dunker. Pl. 57, fig. 90.

Shell strong, whitish, rather yellowish below, with about 14 longitudinal suboblique ribs; whorls 8, slightly convex; aperture channeled below, lip thickened. Length, 5 mill.

Japan.

Unfigured and doubtful Species.

R. WOOD-MASONIANA, Nevill. *Andaman Is.*
R. INDICA, Nevill. *Paumben Sts., So. India.*
R. EFFUSA, Mörch. *West Coast of Centr. America.*
R. FIRMATA, C. B. Ad. *Panama.*

The shell figured by Schwartz for this species and copied by Küster is a very doubtful identification, as is that of *R. scalariformis*, C. B. Ad. which Carpenter declares to be a young shell of *R. firmata*, from an examination of Adams' type specimens. Sowerby, in Reeve's "Iconica," places *R. firmata* in the synonymy of *R. Woodwardi*, Carp.

Section RISSOLINA, Gould. 1861.

R. ELEGANTISSIMA, d'Orb. Pl. 56, fig. 51.

Thick, yellowish white, with close, rounded, longitudinal ribs, cut into a row of nodules next the suture, spirally very thinly striate; whorls 8, rather flat, suture excavated; lip thick, varicose.

Length, 3·5 mill.

West Indies.

R. multicostata, C. B. Ad. is possibly identical.

R. DUBIOSA, C. B. Ad. Pl. 56, fig. 52.

Solid, subpellucid, whitish or yellowish, with about 18–20, straight, elevated longitudinal ribs, scarcely spirally striate; whorls 7–8,

flatly convex, subturreted, with impressed, undulated suture; lip varicose. Length, 5 mill.

West Indies.

It is *R. Dunkeri*, Pfr. teste Weinkauff.

R. DISTANS, Anton. Pl. 56, fig. 56.

Solid, white, shining, with 12 strong, rounded, longitudinal ribs, the interstices scarcely striate; whorls 7, slightly convex, suture undulated; lip varicose. Length, 9 mill.

Philippines.

R. canaliculata, Schwartz is a synonym.

R. PLICATA, A. Ad. Pl. 56, fig. 58–60, 68; Pl. 54, fig. 8,

Whitish, strongly, but narrowly, distantly plicate, the shallow, concave interstices spirally striate; whorls 8, subangulated above and below the suture, the sides flattened; lip somewhat varicose. Length, 5·6 mill.

Philippines, Red Sea, Mauritius.

The synonymy includes *R. scalariformis*, Schwartz, not C. B. Ad. (fig. 68), *R. Bertheloti*, Audouin, *R. denticulata*, Mohrenstern (fig. 59), and *R. scalarina*, A. Ad. Reeve's figure of the latter species (fig. 8). is a very poor one, evidently. Probably *R. subangulata*, Schwartz, (fig. 60) is also to be added to the synonymy of the present species, as the chances are that it is not properly identified by Schwartz as Adams' species and the differential characters are of little or no importance.

R. subangulata, C. B. Ads. is a Jamaica species, and unfigured.

R. ANGULATA, Jickeli. Pl. 56, fig. 50.

Rather solid, white, a little shining, longitudinally costate, costæ sinuate in the middle, thickened above and below, with two scarcely conspicuous spiral ribs at the base; whorls 6?, suture undulated; lip obtuse. Length, 2 mill.

Red Sea.

R. BURDIGALENSIS, d'Orb. Pl. 56, fig. 53.

With about 12 longitudinal ridges, and much wider, shallow, concave interstices, spirally lirate, fimbriating the tops of the ridges; whorls 7–8, subscalariform, somewhat shouldered or turreted, suture undulated; lip with striate varix. Length, 7·3 mill.

Fossil in the Vienna Basin, etc.; living at Mauritius.

The identification of d'Orbigny's fossil with the recent species is on the authority of Schwartz.

R. OBELISCUS, Recluz. Pl. 54, fig. 9.

Solid, white, a little shining, semipellucid, with 12–13 strong, elevated costæ, cutting the basal rib into tubercles, thinly, closely spirally striate; whorls 8–9, turreted, with deep, undulating suture; lip strongly, nodosely varicose. Length, 4·5 mill.

Mauritius, Upolu.

It is *R. Schwartziana*, Dunker (from the latter locality.)

R. COSTATA, A. Ad. Pl. 56, fig. 57.

Opaque, solid, white, with strong, elevated, longitudinal ribs, subangulated above, closely spirally striate; whorls 7, flatly convex, suture undulated; columella subtuberculate below, lip subdilated, flexuous, strongly varicose. Length, 4·7 mill.

Cobija, Peru; *Philippines.?*

R. BAXTERIANA, Nevill. Pl. 56, fig. 75.

Solid, shining, white, with close, large, rounded longitudinal ribs, constricted into three spiral series of nodules, base spirally sulcate; lip thick, but scarcely varicose. Length, 3 mill.

Red Sea.

Weinkauff suggests that this is the juvenile of *R. nodicincta*, A. Ad., but I scarcely think so.

R. SUBDEBILIS, Nevill. Pl. 55, fig. 36; Pl. 56, fig. 55.

Shell solid, whitish, with about 14 compressed, suboblique ribs and slight spiral striæ, the ribs abruptly terminated by two or three basal spiral riblets; whorls about 12, slightly convex, suture subchanneled. Length, 6·5 mill.

Mauritius.

It is *R. canaliculata*, Sowb. (fig. 55). Nevill, who has indicated a var. *perlanceolata*, thinks this may = *R. debilis*, Garrett.

R. WEINKAUFFIANA, Nevill. Pl. 56, fig. 61.

Rather solid, brownish white, with narrow, rather close, subflexuous ribs, and numerous, less distinct spiral striæ, base very indistinctly doubly ridged; lip smoothly varicose. Length, 6·75 mill.

Andaman Is.

It is not unlikely that this will prove identical with the preceding species. In the original figure the ribs are shaded and the interstices left light, an error which has been carefully copied in my illustration.

R. MINUTA, Nevill. Pl. 56, fig. 65.

Shining, white, with longitudinal, thick, slightly oblique, somewhat irregular ribs, and smooth interstices; whorls 8, angularly

turreted, last whorl with a basal spiral row of prominent granules; lip thickened. Length, 2·5 mill.

Andaman Is.

R. SCOLOPAX, Souverb. Pl. 56, fig. 66.

Narrowly, longitudinally costate, costæ subflexuous, ending below in a narrow, nodose, spiral, basal rib, no spiral striæ, white; whorls about 10, subconvex, with moderately impressed suture; aperture a little extended anteriorly, lip subacute. Length, 12 mill.

Loyalty Group, New Caledonia.

R. FUNICULATA, Souverb. Pl. 56, fig. 69.

White, with nearly straight longitudinal ribs and about equal interspaces, terminating below in a spiral rib, and without spiral striæ; lip varicose. Length, 6 mill.

Ins. Art, New Caledonia.

R. SUBFUNICULATA, Nevill. Pl. 56, fig. 64.

Shell solid, opaque, whitish, with large, rounded, close longitudinal ribs, and no spiral striæ, base with a spiral rib and two liræ; whorls 9, somewhat convex, with deep, crenulated suture; lip thick, varicose, crenulated below. Length, 4 mill.

Persian Gulf to Singapore.

R. TURRICULA, Pease. Pl. 56, fig. 63.

Rather solid, shining, white, with flexuous, rather close, rounded longitudinal ribs, the interstices lightly striate, base granulosely spirally costate and bilirate; whorls 8½, suture undulated; columella truncate below, outer lip varicose. Length, 3 mill.

Sandwich and Viti Is., Ceylon, Mauritius.

Nevill has described a var. *Ceylonica*, which does not appear, from the description, to possess distinctive features.

R. PLICATULA, Gould. Pl. 56, fig. 62.

Whitish, with about 15 straight, longitudinal ribs, crossed by cut lines, and a spiral basal rib; lip thickened. Length, 6 mill.

Bonin and Loochoo Is., China, Indian Ocean.

Weinkauff suspects that this should be united with *R. plicata*, A. Ad.; this may be so, but a comparison of figures of the two species shows differences as great as are usually accepted for specific in this group.

R. FIMBRIATA, Souverb. Pl. 68, fig. 3.

Solid, white, rather closely longitudinally costate, base spirally tubercularly costate; whorls 10, planoconvex, suture undulated; lip fimbriately varicose. Length, 6·5 mill.

Ins. Art, New Caledonia.

R. RISSOI, Audouin. Pl. 57, fig. 78; Pl. 55, fig. 20; Pl. 68, fig. 6.

White, longitudinally flexuously costate, with wider intervals, base with a spiral rib, and no other spiral sculpture; whorls 9, somewhat convex; lip varicose. Length, 6·5 mill.

Red Sea, Australia.

The latter locality is for *R. crassa*, Angas (figs. 20, 6), which is a synonym.

R. INFRASTRICTA, Garrett. Pl. 68, fig. 89.

Thick, shining, white, with a few large, longitudinal ribs, no spiral sculpture; whorls 5, strongly convex, restricted at the base and slightly so at the suture; lip varicose. Length, 2 mill.

Viti Is.

R. MERCURIALIS, Watson. Pl. 54, fig. 14.

White, with about 15 narrow, rounded, subflexuous ribs, continuous from whorl to whorl, terminating in a large funicular spiral rib below, the interstices finely, slightly, spirally striate, three of the striæ at the base stronger; whorls 8½, slightly convex, with moderate suture; lip varicose. Length, 4 mill.

Cape York, Australia.

R. SCALARIFORMIS, Watson. Pl. 54, fig. 11.

White, with 12–13 narrow longitudinal, flexuous ribs and much wider furrows, with scarcely visible spiral striæ, base with a stout spiral funiculum; lip varicose. Length, 2·5 mill.

Honolulu, Sandwich Is.

R. DUCLOSI, Montr. Pl. 56, fig. 49.

White, a little shining, longitudinally, obliquely, subdistantly costate, the costæ less distinct on the lower whorls, nodosely funiculate and finely spirally striate below; whorls 8–8½, planoconvex, with moderately impressed suture; lip acute, varicose.

Length, 5 mill.

Ins. Art, New Caledonia.

R. GRADATA, d'Orb. Pl. 68, fig. 84.

Shell pupoidal, strong, white, longitudinally, obliquely, undulately costate, base with several spiral riblets; whorls 6, turreted, suture undulated, channeled; peristome thick. Length, 2 mill.

Jamaica.

Described as a Rissoa, but appears to be more nearly related to this group.

Unfigured Species.

R. TORNATILIS, Gould. *Loochoo Is.*
R. LYRATA, Gould. *Japan.*
R. MONILIFERA, Nevill. *Japan.*
R. SUBANGULATA, C. B. Ad. *Jamaica.*

Section MICROSTELMA, A. Ads. 1863.

R. DÆDALA, A. Ad. Unfigured. *Japan.*
R. CONCINNA, A. Ad. Unfigured. *Suez.*

This species is said to be a young shell, broken and worn, and to = *R. spirata*, Sowb.

Section SCHWARTZIELLA, Nevill. 1884.

R. BRYEREA, Mtg. Pl. 56, figs. 67, 71.

Solid, subpellucid, shining, white, with about 18–22 longitudinal slightly flexuous costæ and equal smooth interstices, no spiral striæ; whorls 7, suture a little undulated; lip with a longitudinally striate varix, rounded below. Length, 5·5 mill.

Cuba, Jamaica.

First described, erroneously, as British. It is *R. nitens*, and *R. lactea*, Brown. Probably *R. scalarioides*, C. B. Ad., is a synonym, but the figure of that species given by Sowerby in Conch. Icon. (fig. 71), is certainly different, and looks more like a worn *Scalaria lineata*, Say.

R. NIVEA, A. Ad. Pl. 55, fig. 24.

Subpellucid, white, shining, subdistantly, elevately, flexuously plicate, obsolete anteriorly where the whorl is spirally striate; whorls convex; lip thickened, but scarcely varicose.

Length, 3·7 mill.

Port Lincoln, Australia.

R. PSEUDOBRYEREA, Nevill. Pl. 56, fig. 70.

Shell solid, white, with strong, wide, straight longitudinal ribs, crossed by narrow, slight spiral striæ; whorls 8, flattened, a little round-shouldered, suture distinct; lip varicose. Length, 5·5 mill.

Red Sea.

It is *R. bryerea*, Schwartz in part.

R. Chesnelii, Mich. Pl. 56, figs. 73, 74.

White, shining, semipellucid, with about 14, subsinuous longitudinal costæ, and about equal interstices which are scarcely spirally striate; whorls 8, a little convex, suture well-impressed, a little undulated; lip with a strong, wide varix. Length, 3·6 mill.

Florida, West Indies.

The synonyms are *R. Catesbyana*, d'Orb. (fig. 74), *R. scalarella*, C. B. Ad., *R. candida*, Brown, and var. *Floridana*, Mörch.

R. triticea, Pease. Pl. 56, fig. 76; Pl. 57, fig. 77.

Whitish, with 11 compressed, prominent, continuous longitudinal ribs, spiral sculpture very indistinct or wanting; whorls 6, slightly convex, with impressed suture; lip thickened. Length, 2·75 mill.

Red Sea, Indian Ocean, Mauritius, Polynesia.

It is *R. scalariformis* of Schwartz, etc. (not Ads.) in part, *R. orientalis*, Nevill, and *R. exigua*, Dunker (fig. 77).

R. Bureasensis, Sowb. Pl. 68, fig. 10.

Solid, yellowish white, with slight, curved longitudinal ribs, fading out on the upper part of the body whorl, smooth; columella thick, short, rather tortuous, almost truncated, outer lip thick.

Length, 5·5 mill.

Ins. Bureas, Philippines.

R. cincta, Angas. Pl. 68, fig. 8.

White, interruptedly chestnut banded, flexuously longitudinally costate, the interstices spirally striate; whorls 7, slightly convex, the last subreticulated. Length, 5 mill.

Port Jackson, Australia.

R. fasciata, Angas. Pl. 68, fig. 7.

Fulvous, with a peripheral chestnut band, appearing on the spire whorls at the suture, with numerous, flexuous longitudinal ribs; whorls 7, slopingly convex; outer lip thick, columella short, almost truncate. Length, 6 mill.

New Zealand.

R. rosea, Desh. Pl. 68, fig. 4.

Rosy white, or roseate, longitudinally plicate, plicæ occasionally varicose; whorls 8, slightly convex, with submargined suture; columella subplicate, lip white, widely thickened. Length, 6 mill.

Ins. Bourbon.

R. flexuosa, Gould. Pl. 68, figs. 2, 1.

Yellowish or chestnut brown, with about 15 obtuse, flexuous longitudinal ribs, and numerous spiral lines; whorls 7, angularly

shouldered, with impressed suture; lip slightly thickened, columella truncately twisted. Length, 15 mill.

Sydney, Australia.

Gould's description was made from an immature specimen (fig. 1); Angas subsequently described it as *R. turricula*, which being preoccupied by Pease, the latter changed to *R. Angasi*.

R. MAINWARINGIANA, Nevill. Unfigured. *Persian Gulf.*

Section PHOSINELLA, Mörch. 1876.

R. CLATHRATA, A. Adams. Pl. 57, fig. 79.

Solid, white, a little shining, clathrate by longitudinal and spiral ridges; whorls 9–10, slightly convex, the last whorl with a basal sulcus and rib below it; lip varicose, subchanneled below.

Length, 12 mill.

Red Sea, Singapore, Philippines, Australia.

R. BICOLLARIS, Schwartz. Pl. 57, fig. 80.

Solid, white, with 18–20 longitudinal, clathrate by spiral ridges, about 8 of the latter on the last whorl. Length, 7 mill.

West Indies.

R. FENESTRATA, Schwartz. Pl. 57, fig. 81.

Solid, white, with 12–14 longitudinal, crossed by spiral liræ, of which there are 5 on the last whorl, intersections nodose; lip varicose, the varix strongly transversely ridged. Length, 4·3 mill.

West Indies, Florida.

R. CANCELLATA, Phil. Pl. 57, figs. 84, 95, 82, 83.

White, cancellated, with 16–18 longitudinal and 7–8 spiral riblets on the last whorl; whorls convex, with deep suture, base with a sulcus, below which are three spiral ribs. Length, 3·3 mill.

West Indies.

R. Philippiana, Pfr. (fig. 95) is a synonym.

Var. PULCHRA, C. B. Ad. Figs. 82, 83.

White, with two distant yellowish bands, cancellated, with 20–22 longitudinal and 7 spiral ridges in the last whorl, the intersections nodose, basal sculpture as in the type. Length, 5·3 mill.

West Indies.

R. Privati, Folin. Pl. 58, fig. 9.

Solid, white, clathrate by longitudinal and spiral ridges; whorls 11, slopingly convex, suture impressed, crenulated; lip subacute.

Length, 5·5 mill.

Haiti.

Perhaps a variety of the preceding species.

R. Deshayesii, Schwartz. Pl. 57, fig. 87; Pl. 68, fig. 9.

Solid, shining, semipellucid, white, nodulously decussated by about 22–24 erect longitudinal, crossed by equal spiral liræ; whorls 9–10, suture impressed, undulated, base channeled and spirally ribbed; lip crenulately varicose, excised below. Length, 9·4 mill.

Philippines.

I suppose that *R. Deshayesiana*, Recluz. (fig. 9), of the Conchologia Iconica is intended for the same species.

R. media, Schwartz. Pl. 57, fig. 89.

Solid, white or yellowish, semipellucid, shining, with 18–20 longitudinal, crossed by spiral ridges; whorls 8, subconvex, with distinct but narrow suture, the base with a funiculum of three spiral riblets; lip sinuous, produced below, varix crenulated.

Ceylon, Java, Nicobar Is.

R. labrosa, Schwartz. Pl. 57, fig. 88.

Solid, white, semipellucid, shining, with 24–26 erect, elevated longitudinal, crossed by closer, less elevated spiral liræ; whorls 9–10, flatly convex, suture subcarinated; lip tumid, thick, broadly sinuated below, crenulately varicose. Length, 9·5 mill.

West Indies.

R. transenna, Watson. Pl. 58, fig. 10.

Solid, white, with 12–14 remote, narrow longitudinal ribs, crossed by somewhat closer spiral liræ; whorls about 7½, convex, but with somewhat shallow suture, basal funiculum consisting of a single nodulous ridge; inner lip concave in the middle, outer lip with a crenulated varix. Length, 3·3 mill.

Fiji Is.

R. Erythræa, Phil. Pl. 57, figs. 97–2; Pl. 58, figs. 3, 4.

Rather solid, white, with 12–14 longitudinal costæ, crossed by closer liræ, the two upper liræ thinner, the lower one granular; whorls slightly convex, with inconspicuous suture; peristome distinctly labiate within, externally varicose, produced below.

Length, 9·75 mill.

Red Sea to Hong Kong, Loo Choo Is.

R. Jickelii, Weinkauff (fig. 4), *R. Blanfordiana*, Nevill (fig. 3), *R. Hungerfordiana*, Nevill (fig. 2), *R. Seguenziana*, Issel (figs. 97, 98) and *R. strigillata*, Gould (figs. 100, 1), as figured by Weinkauff, are synonyms; whether the latter really represents Gould's species is extremely doubtful.

R. BELLULA, A. Ad. Pl. 57, figs. 93, 85.

Semipellucid, white, with strong, distant spiral ribs, nodose at the intersection of usually closer and smaller, longitudinal liræ; whorls 8, slightly convex; lip produced below, externally crenulately varicose. Length, 5 mill.

Philippines.

R. nitida, A. Ad. is apparently identical, but the figure of it given in Reeve's Iconica (fig. 85), looks very like the next species.

R. NODICINCTA, A. Ad. Pl. 57, fig. 94; Pl. 58, fig. 7.

White, with long spiral riblets, generally two on the spire whorls, three or four on the body whorl, the upper ones strongest, nodulous at the crossing of distant longitudinal riblets; whorls 9–10, biangular, with deep suture; lip flexuous, varicose.

Length, 10·6 mill.

Philippines, New Caledonia.

The latter locality is that of *R. hystrix*, Souverb. (fig. 7).

R. GRANULOSA, Pease. Pl. 58, figs. 12, 5.

Solid, white, shining, with three spiral rows of tuberculated ribs on each whorl, and two additional, smaller rows on the lower part of the body whorl, crossed by distant longitudinal riblets; whorls 9, slightly convex, closely striate in the interstices, suture deeply impressed, base with a funicular rib; peristome thick, somewhat dilated. Length, 8·5 mill.

Sandwich and Viti Is.

Pease's single specimen was a juvenile, with four whorls. The above description is taken from that of *R. sculptilis*, Garrett (fig. 5). The species may prove to be a variation of *R. nodicincta*.

R. HORRIDA, Garrett. Pl. 58, figs. 8, 11; Pl. 68, fig. 11.

Thick, white, with distant clathrate ridges, the intersections nodulous, the interspaces deep, in spiral series there are two or three ridges on the upper whorls, and four on the body whorl, besides the basal funiculum; lip varicose, rather widely channeled in front. Length, ? 7 mill.

Viti Is., Port Curtis, Australia.

R. Curtisii, E. A. Smith (fig. 11), and *R. australis*, Sowb. (Pl. 68, fig. 11), are synonyms.

R. CERITHIIFORMIS, Dunker. Pl. 57, fig. 92.

Solid, semipellucid, shining, white, with sometimes a single yellowish band, with 16–18 riblets, vanishing on the base, crossed by spiral liræ, of which there are 4 on the spire, and 7 on the body whorl; whorls 7–8, flatly convex, with channeled suture, base with funiculum; lip externally varicose, columella subtruncate below.

Length, 3·3 mill.

Red Sea, Mauritius, Viti and Sandwich Is.

R. Erythræa, Schwartz, not Phil., is identical, and is the only figure heretofore published; it shows a basal tooth, which is not mentioned in the description, nor does it exist in any of my specimens. It is probably an accidental effect of the produced canal in an old specimen.

R. EXASPERATA, Souverb. Pl. 57, fig. 96.

White, with numerous subobtuse longitudinal ribs and elevated spiral lines, forming rough intersections; whorls 8–9, convex, with deep suture, base subcompressed; lip crenulately varicose.

Length, 3·5–4·5 mill.

New Caledonia, Viti Is.

R. SAGRAIANA, d'Orb. Pl. 57, fig. 86.

Solid, shining, semipellucid, white, granulated by decussating longitudinal and spiral ribs, base with a granular funiculum; whorls 8–9, convex, with deep suture; lip varicose.

Length, 4·3 mill.

West Indies.

R. SAMOENSIS, Dunker. Pl. 57, fig. 99.

Solid, white, with about 14 longitudinal ribs, crossed by spiral lines, of which there are 7 in the last whorl, basal funiculum nodulous; lip crenulately varicose. Length, 4 mill.

Ins. Upolu, Taheiti.

R. CREBRISULCATA, Sowb. Pl. 68, fig. 13.

Whitish, scabrous, with strong, longitudinal, suboblique ribs, nodosely decussated by thin spiral liræ; whorls 8, slightly convex; aperture channeled below, with a short, thick columella, outer lip thick, crenulately varicose. Length, 4 mill.

Hab. unknown.

R. SCABRA, Garrett. Pl. 58, fig. 6.

Shell solid, vitreous, shining, white, with small, rather close, compressed, slightly oblique longitudinal ribs, crossed by numerous

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small, spiral ridges, the intersections granular; whorls 8, flatly convex, subturrited, with deep suture; outer lip stoutly varicose.

Length, 4 mill.

Viti and Samoa Is.

Unfigured Species.

R. BALTEATA, Pease. *Sandwich Is*

R. NITIDULA, Gould. *China Sea.*

R. VILLICA, Gould. *Loo Choo Is.*

The figure named thus in Conch. Icon. represents *R. subvillica*, Nevill.

R. INFREQUENS, C. B. Ad. *Panama.*

Section ZEBINELLA, Mörch. 1876.

R. RETICULATA, Sowb. Pl. 58, figs. 14, 16.

Subsolid, a little shining, whitish, densely reticulated by equal longitudinal and spiral striæ, suture subplane; whorls 10–12, rather flat; lip sinuous, produced at the base, subthickened externally.

Length, 12–14 mill.

West Indies, Bahamas.

R. princeps, C. B. Ad. (fig. 16), is a synonym, and I cannot see how Dr. Weinkauff was justified in considering Sowerby's figure to represent a different species from that of Adams' description. In consequence of this opinion he named the former *R. pseudoprinceps*.

R. DECUSSATA, Mtg. Pl. 58, figs. 15, 17.

Solid, white, shining, with 25–28 slight longitudinal riblets, evanescent below, crossed by very close spiral lines, suture constricted, margined. Length, 5–6 mill.

Florida, West Indies.

First described as British, from a stray specimen. The synonyms are *R. cochlearia*, Bast., *R. subcochlearia*, Orb., *Turbo arenarius*, Maton and Rack., *R. alata*, Menke, *R. pyramidella*, Brown, *R. striato-costata*, d'Orb. (fig. 17), *R. striosa*, C. B. Ad., *R. costulina*, Sismondi.

R. STRIATA, Quoy. Pl. 57, fig. 91; Pl. 58, figs. 13, 23; Pl. 68, fig. 12.

Solid, white, with close longitudinal and spiral lines, the former obsolete on the body whorl; whorls 9–10, slightly convex, apex usually decollated, suture linear; aperture expanded, produced below, lip externally thickened. Length, 17·6 mill.

Philippines, Singapore.

It is *R. cælata*, A. Ad. (fig. 91), *R. grandis*, Phil., and *R. Cumingii*, Reeve, of Sowerby in Conch. Icon. (Pl. 68, fig. 12).

I think that *R. elegantula*, Angas (fig. 13), from So. Australia, will prove a younger state of the species; it has 8 whorls, and is 6 mill. long. A still younger state is probably *R. Mohrensterni*, Desh. (fig. 23), from the Isle of Bourbon; to which locality Nevill adds Red Sea, Indian Ocean and Upolu (*R. Schmeltziana*, Dkr. Ms.).

R. Andamanica, Weink. Pl. 58, fig. 21.

Solid, whitish, with narrow, straight, slight, close longitudinal riblets; whorls 8, suture linear; columella nodosely thickened below, lip varicose. Length, 8 mill.

Andaman Is.

R. concinna, A. Ad. Pl. 58, fig. 18.

Solid, shining, white, closely longitudinally striate, the striæ obscure below, and spirally striulate; whorls 7, slightly turrited, flattened; columella callous below, lip externally varicose.

Length, 5 mill.

Philippines.

R. Adamsiana, Weinkauff. Pl. 58, fig. 20.

White, very obliquely, flexuously striate, with linear suture; whorls 7, flattened; columella thick, lip thickened and expanded, not varicose. Length, 4 mill.

Japan.

R. evanida, Nevill.

White, rather indistinctly, obliquely, longitudinally undulated, narrowly and scabrously spirally striate; whorls 6, somewhat convex; lip crenulated and varicose. Length, 2·5 mill.

Andaman Is.

R. tenuistriata, Pease. Pl. 58, fig. 24.

Solid, white, thinly longitudinally striate, the striæ fading below, where they are replaced by spiral lines; whorls 6–7, subconvex; aperture subeffuse, with callous columella. Length, 9 mill.

Paumotus Is.

The figure is a copy of that originally given for this species, but does not at all correspond with the specimens before me, sent by Pease under this name.

R. dimidiata, Jickeli. Pl. 58, fig. 22.

Rather solid, whitish, longitudinally narrowly costulate, the riblets fading on upper part of body-whorl, interstices and base of

body-whorl impressly spirally striate; whorls 8, slightly convex, with impressed suture; lip scarcely varicose. Length, 4·3 mill.

Red Sea.

R. STRIATULA, Pease. Pl. 68, fig. 16.

Strong, white, closely and thinly spirally striate; whorls convex, suture shallow; aperture effuse below, columella callous, lip not varicose. Length, 9 mill.

Paumotus Is.

R. FLAMMEA, Pease. Pl. 68, fig. 17.

Solid, whitish, with longitudinal ashy grey stripes, subconfluent, spirally finely grooved, the grooves interruptedly lined with light brown; whorls plane, suture well impressed. Length, 3 mill.

Caroline Islands.

Described as a Rissoa—which perhaps it is.

R. ZELTNERI, Folin. Pl. 68, fig. 19.

Shell solid, shining, white, with numerous, thin, oblique, longitudinal striæ, evanescent below, spiral striæ inconspicuous or obsolete except on the base, where they become distinct and replace the longitudinal sculpture; columella a little truncate, diagonal, ending in a narrow channel, lip thickened. Length, 4·5 mill.

Panama.

R. MILLECOSTATA, Garrett. Pl. 56, fig. 47.

Rather thin, white, with numerous, slightly oblique, close, minute longitudinal riblets, and fine spiral striæ, both becoming obscure below; whorls 11, flatly convex, with deeply incised suture; peristome thick, slightly sinuous above, not varicose.

Length, 9 mill.

Viti Is.

Unfigured Species.

R. SIGMIFER, Mörch.	*Bahamas.*
R. JANUS, C. B. Ad.	*Panama.*
R. MODESTA, Gould.	*Loo Choo Is.*
R. ANNULATA, Hutton.	*New Zealand.*

Section MORCHIELLA, Nevill. 1884

R. GIGANTEA, Desh. Pl. 58, fig. 25.

Solid, somewhat shining, white; whorls 9, convex, the first ones with longitudinal costæ crossed by thin spiral striæ, afterwards the

spiral sculpture alone persists to the last whorl, where it also becomes obsolete; lip varicose. Length, 28 mill.

Philippines.

It is *R. Cumingii*, of H. and A. Adams, not Reeve.

R. ANTONI, Schwartz. Pl. 58, fig. 26.

Solid, white; whorls 7–8, well rounded, with channeled suture, the earlier whorls longitudinally ribbed, nodulously cancellated by three revolving ribs, on the penultimate the spiral sculpture is most prominent, and on the body whorl there is no sculpture except a narrow shoulder; lip thickened and varicose. Length, 7·8 mill.

Java.

R. SPIRATA, Sowb. Pl. 58, figs. 27–29; Pl. 59, figs. 30–32, 35–37.

Shell rather solid, smooth, microscopically spirally striate, somewhat shining, white; whorls 7–8, flattened, the earlier ones with longitudinal costæ, often subject to a torsion of the axis, suture narrowly channeled; lip thick, but not varicose.

Length, 15–23 mill.

Indian Ocean, Japan, Philippines, New Caledonia, Viti Is.

The above description has necessarily been rendered so as to cover a little variation in form and sculpture, necessitated by the inclusion of several names as synonyms; thus some specimens are distorted, others straight, there is a difference in the convexity of the whorls, and some are smooth, varying to those in which faint spiral striæ are perceptible. The synonymy includes *R. deformis*, Sowb. (fig. 27), *R. Montrouzieri*, Souverb. with its vars. *substriolata*, *monstrosa* and *convexior* of Nevill—held by some conchologists to be the *R. deformis* of the "Conch. Icon." (fig. 35), but not that of the "Genera of Shells," *R. supracostata*, Garrett (fig. 31), *R. striolata*, A. Ad. (fig. 30), *R. Lamberti*, Souverb. (fig. 32), *R. Japonica*, Weink. (fig. 36), *R. d'Orbignyi*, A. Ad. (fig. 28), and its vars. *submarginata*, *subspirata* and *pachylabris*, Nevill, and *R. Artensis*, Montr. (fig. 37). *R. concinna*, A. Ad., made by him a species of Microstelma, is said to be a broken, juvenile of this species.

R. ALBIDA, C. B. Adams. Pl. 59, fig. 34.

Diaphanous, whitish, spire sharp, elegantly decussated by longitudinal costæ and spiral liræ; whorls 10, suture submargined, body-whorl smooth. Length, 6·2 mill.

West Indies.

R. affinis, C. B. Ad. (unfigured), is supposed to be a narrower variety of this species.

R. PERCRASSA, Nevill. Pl. 59, figs. 38, 51.

Solid, shining, white; whorls about 12, the earlier normal ones longitudinally costate, afterwards smooth, suture narrowly margined; lip thickened, smooth within, externally varicose.

Length, 12·5 mill.

Upolu, Tahiti, Mauritius.

R. percrassa (fig. 38), was described from a Mauritian specimen, abnormal in possessing a strong callous thickening of the lower part of the body whorl; subsequently, what appears to be a normal growth of the same species was described by Nevill under the name of *R. Peasiana* (fig. 51).

R. INSIGNIS, Ad. and Reeve. Pl. 59, figs. 40, 33.

Solid, white, or tinged with yellow; whorls 5, subgradate, the upper ones longitudinally costate, the others spirally striate; lip thick, crenulated within. Length, 9 mill.

Red Sea, Indian Ocean, China, Society Islands.

The last locality is for *R. turrita*, Garrett (fig. 33). The figure and the type specimen do not exhibit the interior crenulations of the lip, but they are mentioned in Garrett's description, and probably the latter was drawn from a more adult specimen than the one sent for illustration.

Section ZEBINA, H. and A. Adams. 1854.

R. TRIDENTATA, Mich. Pl. 59, figs. 41–44, 39, 54; Pl. 68, fig. 14.

Solid, smooth, polished, white, whorls 7, almost plane, the upper ones sometimes costate, suture simple; lip subdilated, thickened, not varicose, tridentate, bidentate, or unidentate within, sometimes without teeth. Length, 8 mill.

Red Sea, Philippines, Mauritius, Viti and Sandwich Is.

It is *R. curta*, Sowb. Ms., *R. crassilabrum*, Garrett (fig. 14), *R. semiglabrata*, A. Ad. (fig. 39), *R. bidentata*, Phil. (fig. 42), *R. coronata*, Recluz. (fig. 43), *R. eulimoides*, A. Ad. (fig. 44), and *R. semiplicata*, Pease (fig. 54), not adult.

R. AFFINIS, Garrett. Pl. 59, fig. 62.

Rather solid, smooth, shining, white, spire elevated, rapidly tapering; whorls 7–8, slightly convex, the last swollen, slightly compressed, suture linear; lip very thick, dilated, sinuous above and below, columella and parietal region callous. Length, 5 mill.

Viti Islands.

Appears to differ from the foregoing species, in being usually narrower, with as many or more whorls, although smaller in size.

R. ORYZA, Garrett. Pl. 59, fig. 47, 53, 52, 56.

Solid, smooth, shining, white, spire rapidly tapering, with obtuse apex; whorls 6–7, flatly convex, suture broadly margined; lip thick, dilated, columella oblique. Length, 2 mill.

Viti Islands (Garrett), *Persian Gulf*, *Mauritius* (Weinkauff), *Japan* (Adams).

R. Stoppani, Weink., not Issel (fig. 53), and *R. subulina*, Weink. (fig. 52), from Japan, are synonyms; the latter a somewhat larger shell (3·75 mill), having 8 whorls. The Red Sea fossil species, which Issel called *R. Stoppani*, has no margined suture.

Var. SUBLÆVIGATA, Nevill. Fig. 56.

Appears to differ principally in the aperture being more broadly rounded below.

Indian Ocean, Polynesia.

R. LÆVIGATA, C. B. Adams. Pl. 59, figs. 48, 50.

Shining, pellucid, smooth, white; whorls 9–10, slightly convex, suture white-margined; lip subdilated, externally thickened.

Length, 4·5 mill.

West Indies.

The above is the description of *R. vitrea*, C. B. Ad. (fig. 50), which appears to be the adult of the earlier described *R. lævigata*.

R. BROWNIANA, d'Orb. Pl. 59, figs. 45, 46.

Solid, polished, white, usually with two or three chestnut bands on the last whorl, bimaculate near the aperture; whorls 8–9, slightly convex; suture not margined; lip thickened externally.

Length, 4·7 mill.

West Indies.

R. lævissima, C. B. Ad., is a synonym, according to Mörch, etc. The figure, however, as given in Reeve's Iconica (fig. 46), appears more nearly related to the next species.

R. SLOANIANA, d'Orb. Pl. 59, fig. 49.

Thick, white, smooth, polished; whorls 5–6, flatly convex, suture not margined; lip externally thickened, with usually two internal callous teeth. Length, 3·8 mill.

West Indies.

Besides frequently being possessed of apertural teeth, this species is stouter, with fewer whorls than the preceding one.

Section PYRAMIDELLOIDES, Nevill. 1884.

R. MIRANDA, A. Ad. Pl. 59, figs. 57–59, 55.

White, whorls 7, with revolving nodulous ribs, of which there are two of unequal size on the spire whorls, the body whorl with about four series; outer lip crenulately varicose. Length, 3 mill.

Red Sea, Indian Ocean, Japan, Mauritius.

R. insolita, Desh. (fig. 55), and *R. Bellardii*, Issel (fig. 59), are synonyms.

Section STOSSICHIA, Brusina. 1878.

R. PSEUDOCONCINNA, Nevill. Pl. 58, fig. 19.

Whitish, thinly longitudinally costulate, and more thinly spirally striate, the longitudinal sculpture obsolete below; whorls 6, somewhat convex; aperture narrowly channeled in front, lip varicose. Length, 9 mill.

Japan.

This name is substituted for *R. concinna*, Sowb., not Adams.

R. MIRABILIS, Dunker. Pl. 59, fig. 60.

Light ochraceous; whorls 9, somewhat convex, with close longitudinal ribs, crossed by spiral liræ, the intersections nodulous; suture impressed; aperture widely channeled below, columella nodulous below, lip varicose. Length, 5·5 mill.

Ins. Upolu.

R. ABNORMIS, Nevill. Pl. 59, fig. 61.

White; whorls 6, with about 15 longitudinal ribs, vanishing towards the base, crossed by dense spiral liræ, the intersections subgranular; aperture broadly channeled, lip crenulately varicose. Length, 3 mill.

Mauritius, Ceylon.

Subgenus EATONIELLA, Dall. 1876.

R. KERGUELENENSIS, Smith. Pl. 60, fig. 67.

Scarcely rimate, thin, semipellucid, blackish olivaceous, lighter towards the lip, a little shining, striated by incremental lines; whorls 6, convex, suture simple; peristome simple, continuous. Length, 3 mill.

Kerguelen's Land.

R. SUBRUFESCENS, Smith. Pl. 60, fig. 68.

Scarcely rimate, thin, semidiaphanous, chestnut color, whitish towards the lip, smooth, with thin incremental striæ; whorls 4½,

convex, with deep suture; aperture subcircular, peristome continuous. Length, 1·5 mill.

Kerguelen's Land.

R. CALIGINOSA, Smith. Pl. 60, fig. 69.

Scarcely rimate, rather thin, slightly shining, smooth, with obsolete incremental striæ, blackish; whorls 4½, convex, with deep suture; peristome continuous, smoothly thickened, reflected at the whitish umbilical region. Length, 2 mill.

Kerguelen's Land.

On account of *Littorina caliginosa*, Gould, which he supposed to belong to the same group, Dr. Dall changed the name of the present species to *R. Smithii.*

Unfigured Species Referred to Rissoina.

The subdivisions not indicated in the descriptions.

R. GRACILIS, Pease. *Sandwich Is.*

R. TERES, R. PULCHELLA, R. INCONSPICUA, R. INERMIS, R. EFFICATA, R. CARDINALIS, Brazier. *Australia.*

R. SUPRASCULPTA, R. KERSHAWI, R. CYLINDRACEA, R. CRETACEA, Tenison-Woods. *Australia.*

R. MINUTISSIMA, R. UNILIRATA, R. FLINDERSII, R. CONCATENATA, Tenison-Woods. *Tasmania.*

R. APPROXIMA, Petterd. *Tasmania.*

R. EXPANSA, Carpenter. *Mazatlan.*

R. INTERFOSSA, Carp. *California.*

R. CONTABULATA, Mörch. *Sonsonate, Central America.*

R. VITRINELLA, Mörch. *West Indies.*

R. PLICATA, R. RUGULOSA, Hutton. *New Zealand.*

Genus BARLEEIA, Clark. 1855.

B. RUBRA, Adams. Pl. 60, figs. 70–72.

Solid, smooth, shining, indistinctly spirally striate, chestnut or yellowish brown color; whorls 5½, slowly increasing, suture smooth, margined by a darker band, lip thick, simple. Length, 2·5 mill.

Europe.

B. unifasciata, Mont. (fig. 71), *B. aurantiaca*, Brus., *B. fulva*, Mich. (fig. 72), and vars. *majuscula*, Monts. (*major*, Monts.), *albescens*, Requien, *pallida*, Jeffreys, are synonyms.

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B. SUBTENUIS, Carpenter. Pl. 60, fig. 73.

Thin, subpellucid, corneous-chestnut; with 4 normal whorls, flatly convex, with distinct suture; lip acute. Length, 2·8 mill.

Southern California to Mazatlan.

Var. RIMATA, Carp.

A little more tumid, whorls less flattened, umbilical slit conspicuous.

B. HALIOTIPHILA, Carp. Pl. 60, fig. 74.

Smooth, thin, chestnut colored; normal whorls 5, subplanate, with distinct suture, body whorl obsoletely angulated; lip thin.

Length, 2·5 mill.

Lower California (on Haliotis).

B. IMBRICATA, Watson. Pl. 60, fig. 75.

Brownish-yellow to white, with incremental striæ above, base spirally striate; whorls 8, flat, a little angulated above and below the impressed suture; lip sharp, thin. Length, 2·75 mill.

Sandwich and Fiji Islands, N. E. Australia.

B. ROSEA, Hutton. Pl. 71, fig. 6.

Whorls 4, flatly convex, smooth, polished, bright pink or white; aperture round. Length, 1·75 mill.

Stewart Isl., New Zealand,

R. IMPOLITA, R. NANA, Hutton. (Unfigured). *New Zealand.*

Genus FAIRBANKIA, Blanf. 1868.

F. BOMBAYANA, Blanf. Pl. 60, fig. 63.

Imperforate, somewhat solid, whitish, under a brownish olivaceous epidermis, the incremental striæ crossed by spiral rather distant lines; whorls 7, slightly convex, suture impressed; lip a little expanded, with strong external varix. Length, 7 mill.

Bombay.

F. FEDDENIANA, Nevill. (unfigured). *Kathiawar, India.*

Genus IRAVADIA, Blanf. 1867.

I. ORNATA, Blanf. Pl. 60, fig. 66.

Imperforate, solid, whitish under a brownish or olivaceous epidermis, with spiral costæ, the interstices closely vertically costulate;

whorls 9–10, slopingly flattened, suture inconspicuous; lip nodosely varicose. Length, 4·5 mill.

Pt. Canning and Delta of the Irawady.

I. TROCHLEARIS, Gould. Pl. 60, figs. 64, 65.

Imperforate, thick, ash colored, with 7 whorls, of which 4 are normal, with elevated spiral ribs, interstices channeled and very finely decussated; lip subvaricose. Length, 4 mill.

Japan, Hong Kong, Singapore, Ceylon, Persian Gulf.

I. sulcifera and *I. ligata*, Gould, teste Sowb., *I. imbricata*, Gould, *I. annulata*, Dunker, and var. *minor*, Nevill (fig. 65), are synonyms.

I. SULCIFERA, Troschel. Pl. 68, fig. 95.

Turreted, thick, strongly spirally ribbed and sulcate, 10 ribs on the last, 4 on the upper whorls, those on the base smaller, suture distinct; lip thick, but not varicose, expanded below.

Length, 12 mill.

Peru.

An aberrant form which I am unable to locate satisfactorily. I am not aware that it has been recognized by any conchologist since its publication in 1852.

Genus FENELLA, A. Ad. 1871.

F. PUPOIDES, A. Ad. Pl. 60, fig. 76.

Imperforate, thin, pupoidal, pale brown, with a chestnut band on the middle of the whorls, two on the last whorl; whorls 7½, earlier ones subangulated in the middle, the others convex, spirally striate; lip simple.

Japan.

Is perhaps a variation of the next species.

F. VIRGATA, Phil. Pl. 60, fig. 79.

Thin, yellowish, with light chestnut longitudinal flames, closely spirally striate; whorls 7–8, convex, sometimes varicose; columella subtruncate. Length, 6 mill.

Red Sea.

F. SUBPUPOIDEA, Tryon. Pl. 60, fig. 77.

Whorls about 6, convex, closely spirally striate, thin, light olivaceous or brownish, with a series of chestnut spots under the suture; lip simple, sharp. Length, 6 mill.

Monterey, Cal.

Name changed from *F. pupoidea*, Carp., preoccupied by A. Adams.

F. EXCURVATA, Carp. Pl. 60, fig. 78.

Thin, turreted, purplish brown; whorls 8, the first two smooth, afterwards bi-or tricarinate, the others superficially cancellated, base spirally striate only; lip thin. Length, 2·75 mill.

Mazatlan.

F. CERITHINA, Phil. Pl. 60, figs. 80, 81.

Granularly decussated by about 15 longitudinal riblets and 4 spiral liræ, base spirally costulate, chestnut colored; whorls 8, flatly convex, with deep suture; lip simple. Length 3·3 mill.

Ins. Rodriguez, Red Sea, Persian Gulf, Japan.

F. reticulata A. Ads. (fig. 81), and *F. scabra*, A. Ads., are synonyms.

F. ELONGATA, Watson. Pl. 60, fig. 82.

White, with lattice-like sculpture of distant longitudinal ribs, crossed by two or three spiral riblets (about four in last whorl); whorls 12, convexly biangulated, with deep suture. Length, 9 mill.

Culebra I., W. I.; 390 fms.; *Azores*, 1000 fms.

F. INFRATINCTA, Garrett. Pl. 60, fig, 83.

Rather thin, subpellucid, shining, whitish, tinged with brown at the base, decussated by longitudinal ribs and spiral liræ; whorls 8, moderately convex, with impressed suture; lip thin.

Length, 2·5 mill.

Viti and Samoa Islands.

F. SEMICOSTATA, Pease. Pl. 60, fig. 84.

Subcylindrical, rather solid, whitish or light yellowish, with small, close, longitudinal rounded ribs, crossed by close spiral striæ, the ribs becoming evanescent on lower part of body whorl; whorls 5–6, slightly convex, with shallow, impressed suture.

Length, 3 mill.

Caroline Islands.

Unfigured Species.

F. FULGIDA, C. B. Ad. (Nevill). *Natal.*
F. RISSOIFORMIS, Issel. *Red Sea.*
F. CRYSTALLINA, Carpenter. *Cape St. Lucas, L. California.*
F. VINACEA, Recluz, (Nevill). *Mauritius.*

DUNKERIA FERRUGINEA, CANDIDA, RUFOCINCTA, FUSCA, CRATICULATA, ASPERULATA, PULCHELLA, all of A. Adams.

China and Japan.

These have been included in Fenella by Nevill.

Genus PUTILLA, A. Ad. 1867.

P. LUCIDA, A. Ad. Pl. 60, fig. 85.

Rimate, solid, subpellucid, smooth, shining, white; whorls 4, convex; lip simple, thick. Length, 3 mill.

Japan.

Genus SKENELLA, Pfeffer. 1886.

S. GEORGIANA, Pfeffer. Pl. 60, fig. 96, 97.

Shell with Lacuna-like umbilicus, obliquely, longitudinally, irregularly, thinly, plicate-striate, greyish brown; whorls 3, rounded, with deep suture; lip simple, acute, continuous, aperture bright corneous, shining. Length, 1·5 mill.

Isl. South Georgia.

Family *JEFFREYSIIDÆ.*

Genus JEFFREYSIA, Alder. 1849.

J. BIFASCIATA, Carp. Pl. 60, fig. 86.

Narrowly umbilicated, diaphanous, very thin, smooth, light brownish, with two darker bands, sometimes absent; whorls 5, subtumid, suture impressed, margined. Length, 1·25.

Mazatlan.

J. ALDERI, Carp. Pl. 60, fig. 87.

Like the preceding, but much larger and more solid; whorls 5, more planate, bands narrow. Length, 1·75 mill.

Mazatlan; Todas Santos Is., L. Cal.

J. GLABRA, (Alder) Brown. Pl. 60, fig. 88.

Shell rimate, very thin, pellucid, smooth, vitreous white, spire obtusely truncate; whorls 4½, convex, with deep suture; aperture rounded, columella flexuous. Length, 1·5 mill.

Europe.

J. diaphana, Alder is a synonym, and is the name under which this species is generally known.

J. OPALINA, Jeffreys. Pl. 60, fig. 89.

Rimate, very thin, semipellucid, shining,, opaline, corneous; whorls 3½, tumid, rapidly increasing; lip acute, base expanded, columella flexuous. Length, 2 mill.

Europe.

Monterosato has indicated a var. *minor.*

J. GLOBULARIS, Jeffreys. Pl. 60, fig. 90.

Narrowly rimate, very thin, pellucid, iridescent, smooth, white, apex obtuse; whorls 3½, rapidly increasing, suture deep; aperture subsolute, lip thin, a little incurved above. Length, 1 mill.

Great Britain.

J. CYLINDRICA, Jeffreys. Pl. 60, fig. 91.

Narrowly umbilicated, shining, hyaline; whorls 4, shortly convex, apex obtuse, suture distinct; aperture subeffuse, lip continuous. Length, 1 mill.

Mediterranean Sea.

J. EDWARDIENSIS, Watson. Pl. 60, fig. 92.

Minutely rimate, thin, glossy, hyaline white, microscopically longitudinally and spirally striate; whorls 4½, tumidly convex, suture rather shallow. Length, 1·85 mill.

Prince Edward Isl. between Cape of Good Hope and Kerguelen.

J. SANCTI-PAULI, Vélain. Pl. 60, fig. 93.

Minutely rimate , thin, slightly spirally striate; whorls 5, moderately convex, suture narrowly margined; aperture rounded oval, lip sharp. Length, 3 mill.

Ins. St. Paul, Indian Ocean.

Unfigured and undetermined species.

J. MINIMA, J. MUNDULA, J. TURGIDULA, J. HYDROPHANA, J. VITRINA, J. VESICALIS, J. SPIRALIS, J. OMPHALOTROPIS, A. Ad. *Japan.*

J. TRANSLUCENS, Carp. *California.*

J. TUMENS, Carp. = *Cythnia*, Vol. viii, p. 293.

J. NITIDA, Sars. = *Liostomia eburnea*, Stimp. Vol. viii, p. 344.

J. vitrea, Jeffreys is a synonym.

Subgenus TATEA, Tenison Woods. 1879.

J. HUONENSIS Tenison Woods. Pl. 60, fig. 94.

Scarcely rimate, thin, smooth, corneous or light olivaceous; whorls 7, flatly convex, periphery subangulated; aperture oval-rounded, peristome darker colored, acute. Length, 4 mill.

Tasmania.

Subgenus DARDANIA, Hutton. 1882.

J. OLIVACEA, Hutton. Pl. 60, fig. 95.

Imperforate, smooth, with fine growth-lines, shining, olivaceous or blackish, often showing a few grey spots around the suture, and

another series on the periphery of the last whorl; whorls 4, convex, with impressed suture. Length, 2 mill.

New Zealand (on seawood).

Family *SKENEIDÆ.*

Genus SKENEA, Fleming. 1828.

S. SUBCANATICULATA, E. A. Smith. Pl. 60, figs. 98, 99.

Shell thin, subdiaphanous, whitish, widely, profoundly umbilicated; whorls 3½, slowly increasing, convex, with deep, almost channeled suture. Diam. 1·3 mill.

Kerguelen Island.

S. PLANORBIS, Fabr. Pl. 60, fig. 100.

Rather thin, widely, patulously umbilicated, opaque, brownish-yellow, or pale olivaceous, spire slightly elevated; whorls 4, subcylindrical, rapidly increasing, smooth, base subconcave, suture deep. Diam. 1·4 mill.

Europe, Greenland to Massachusetts.

It is *Helix depressa*, Mont., and *S. trochiformis*, Locard. *S. serpuloides* of Gould and earlier American authors is also to be placed here.

S. SERPULOIDES, Montg. Pl. 60. figs. 1, 2.

Widely umbilicated, its wall with spiral striæ, brownish yellow, smooth; whorls 4, cylindrical, spire a little elevated, suture deep. Diam. 1 mill.

Europe.

It is *Delphinula lævis*, Phil. (fig. 1.), and *S. divisa*, Forbes and Hanley.

Unfigured Species.

S. HELICINA, (Jeffreys, Ms.), Monts. *Mediterranean.*
S. pellucida, Monts. is a synonym.
S. PETITII, Fischer. (Not a Skenea?) *West Indies.*
S. CORNUELLA, A. Ad. *Japan.*

Family *CHORISTIDÆ.*

Genus CHORISTES, Carpenter. 1872.

C. ELEGANS, Carp. Pl. 61, fig. 3.

Thin, fragile, moderately umbilicated, epidermis thin, caducous,

smooth; whorls 4–5, very convex, with deep suture; lip simple, everted partially over the umbilicus. Length, 6 mill.

Off Martha's Vineyard, Mass.; 255 fms.

Recent specimens agree well in form and structure with the above named Canadian post-pliocene fossil; they are, however, somewhat larger, and thinner, and Verrill has accordingly given them the varietal name of TENERA.

Family *HOMALOGYRIDÆ.*

Genus HOMALOGYRA, Jeffreys. 1867.

H. ATOMUS, Phil. Pl. 61, figs. 4–6.

Discoidal, planorbiform, very widely umbilicated, spire depressed rather thin, semipellucid, smooth, slightly arcuately striate, somewhat shining; whorls 4, convex, rapidly enlarging, with deep suture; lip thin, simple. Diam. 1 mill.

Europe.

It is *Skenea nitidissima*, Forbes and Hanley, *H. simplex*, Costa. vars. *pallida* and *polyzona*, Brusina, and Var. *vitrea*, Duprey.

H. ROTA, Forbes and Hanley. Pl. 61 fig. 7.

Discoidal, flat above and concave below, very smooth, subpellucid, shining, with short radiating ribs above and below, enlarging and curving from the sutural line, and not extending to the periphery, whorls 3, convex, with deep suture. Diam. 5 mill.

Europe.

H. pulchella, and *H. paucicostata* Costa, and *Adeorbis costatus*, Weink. are synonyms.

H. FISCHERIANA, Monts. Pl. 61, figs. 8, 9.

Planorbiform, discoidal, fulvous, with three spiral brown lines; whorls 4, with slight, numerous, incremental striæ.

Diam. 1 mill.

Mediterranean Sea.

H. DENSICOSTATA, Jeffreys. Pl. 61, figs. 10, 11.

Planorbiform, semitransparent, glossy, nearly flat above, concave below, with close-set incremental striæ, finally becoming microscopic; whorls 4, rapidly increasing, the last one with a central carina on the upper and lower surfaces, and another on the periphery; suture narrow, but excavated. Diam. 1·87–3 mill.

Off Newfoundland, 1622 fms! *Cape Hatteras, N. C.* 7–17 fms.

The last locality is for *Skenea trilix*, Bush, which appears to me to be a better grown condition of Jeffreys' species.

H. CANCELLATA, Krauss. Pl. 61, figs. 12–14.

Planorbiform, flat above, concave and widely umbilicated below, thin, white, distinctly cancellated; whorls 5, convex, the last ventricose, periphery subcarinate. Diam. 2·25 mill.

Algoa Bay, So. Africa.

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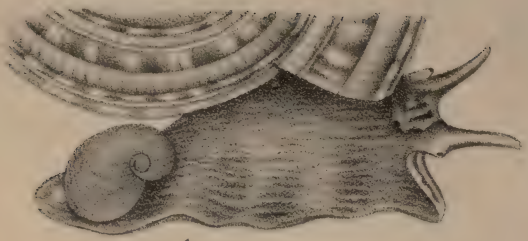
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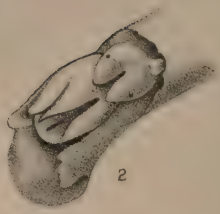
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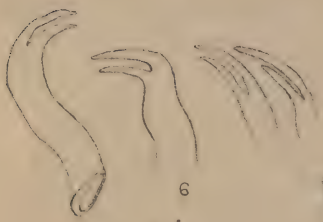
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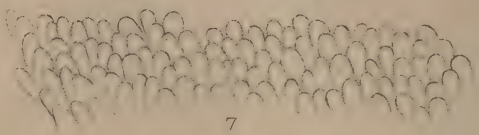
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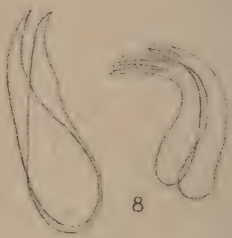
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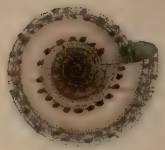
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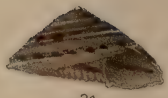
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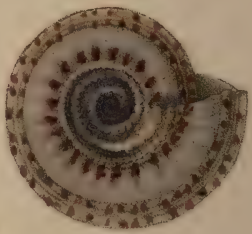
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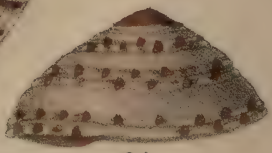
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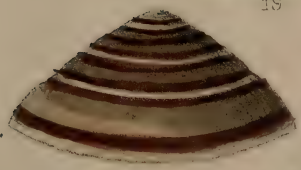
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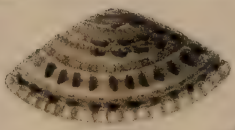
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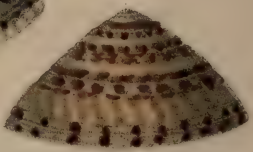
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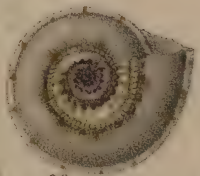
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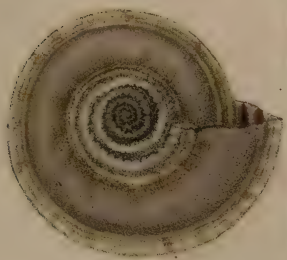
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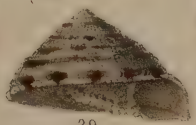
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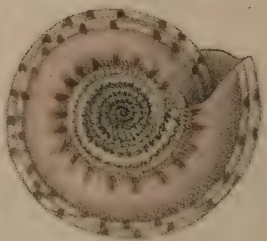
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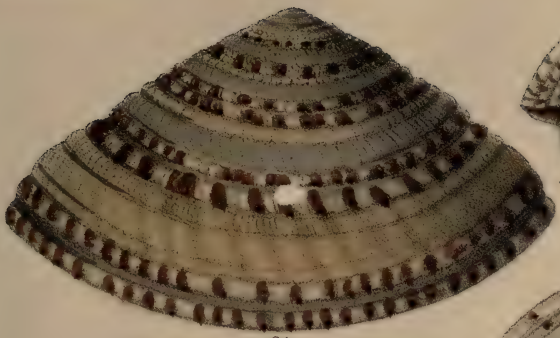

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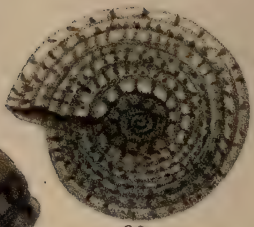

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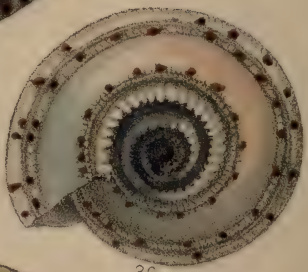

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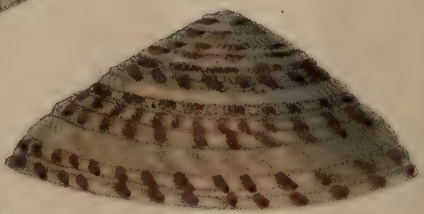

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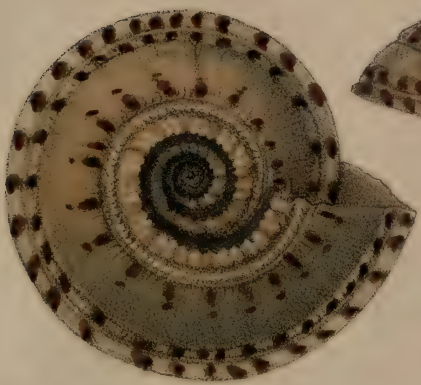

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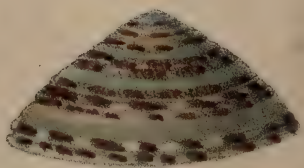

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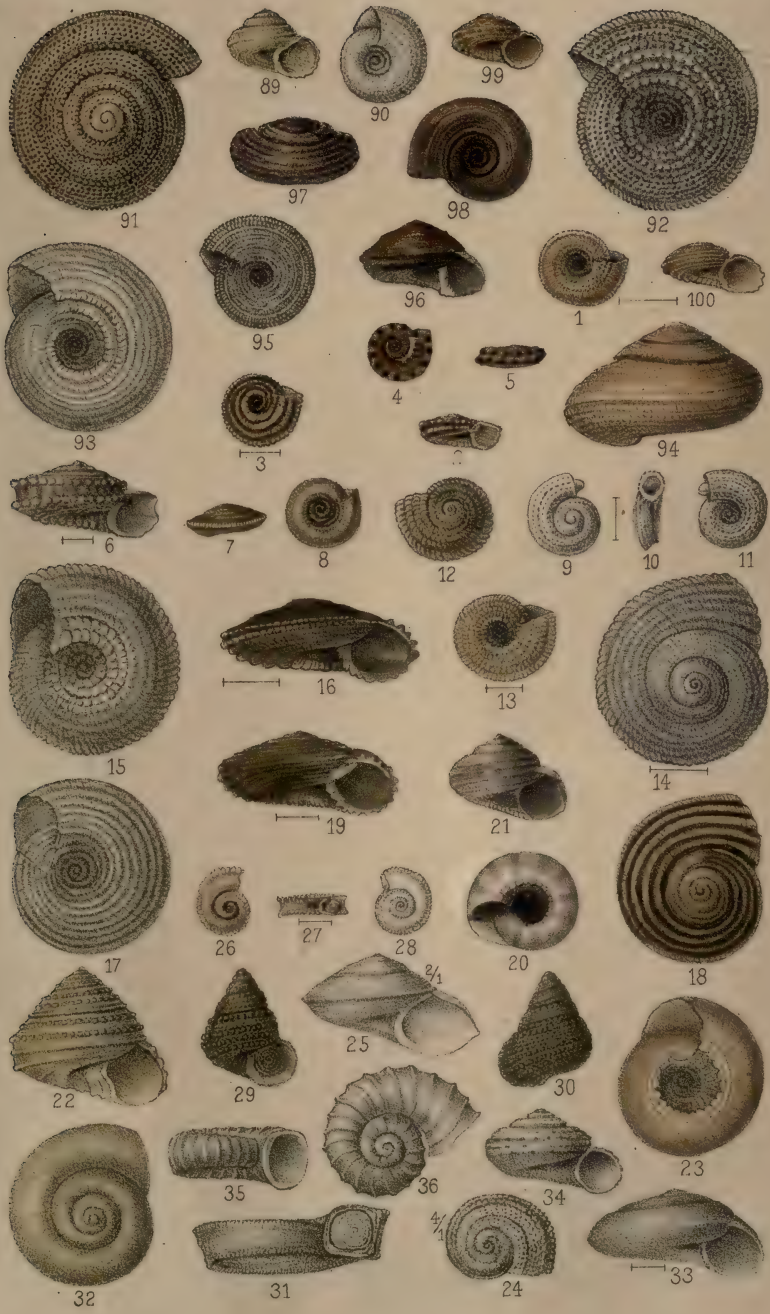
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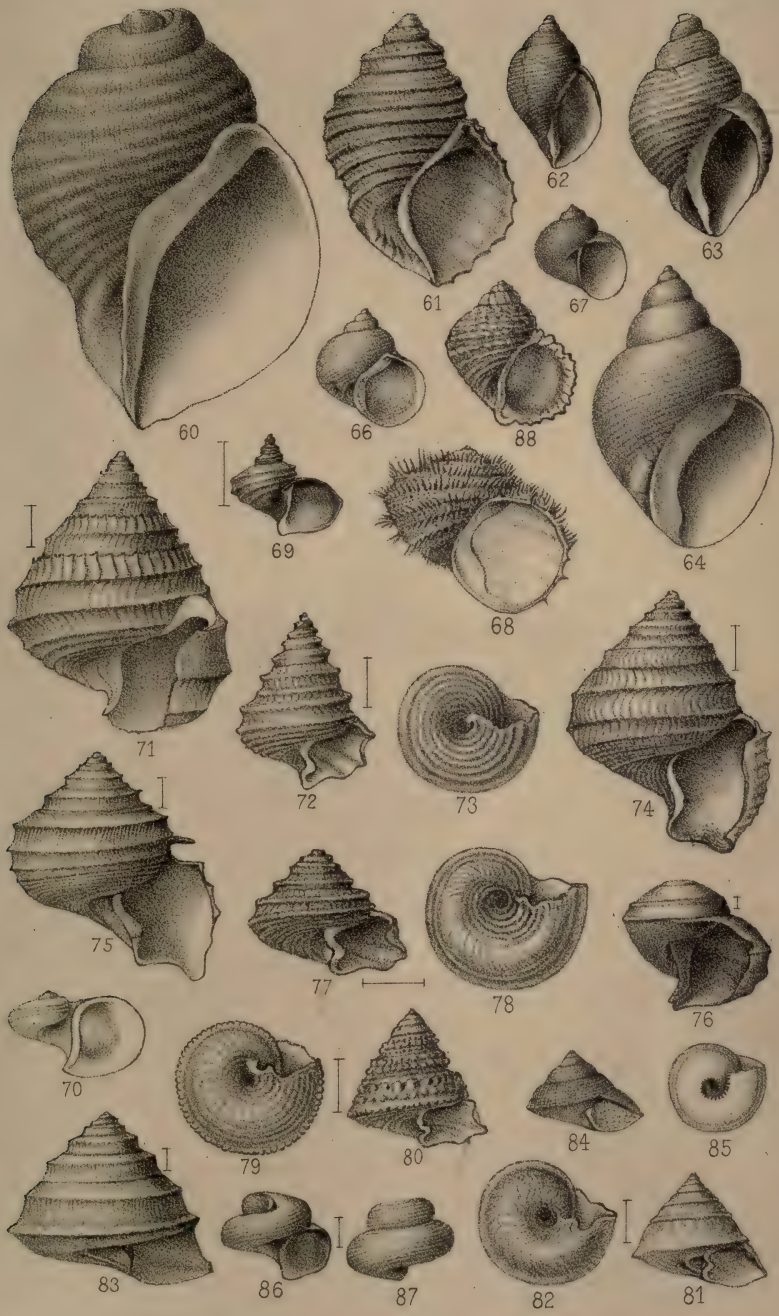
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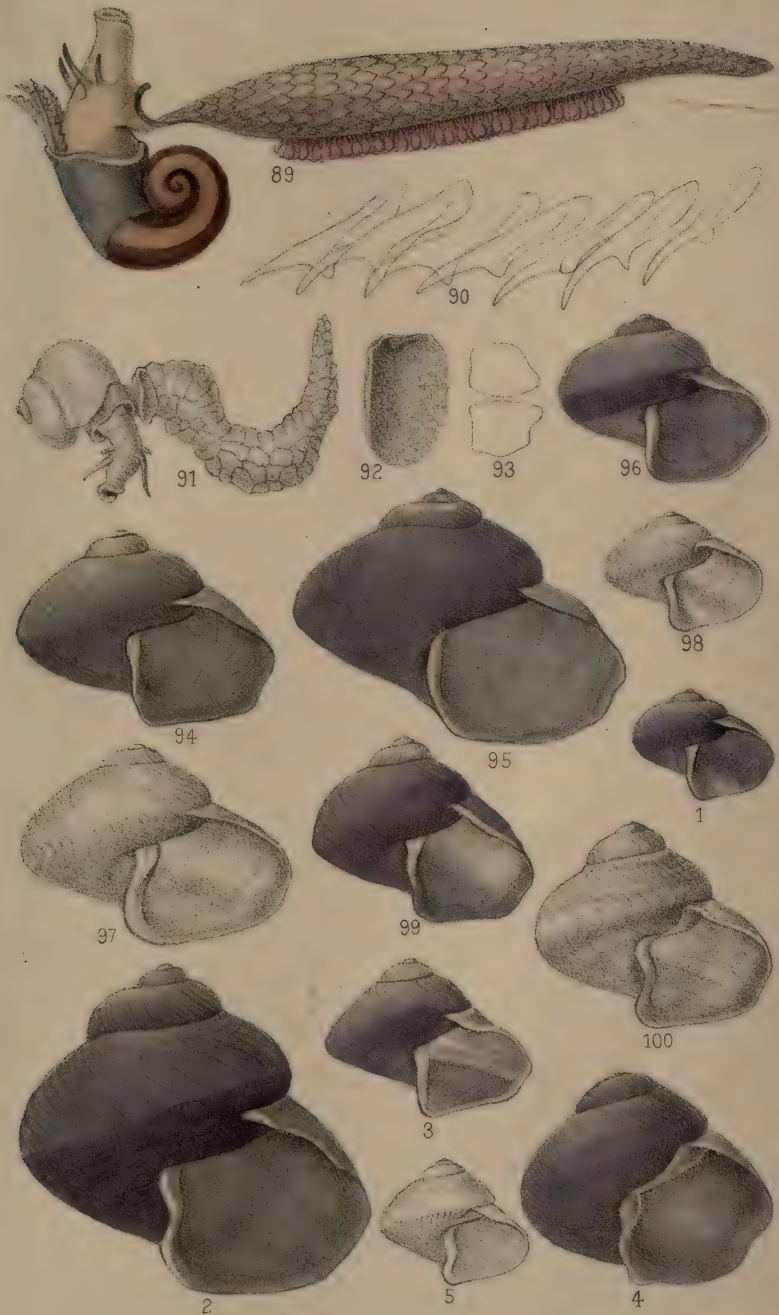
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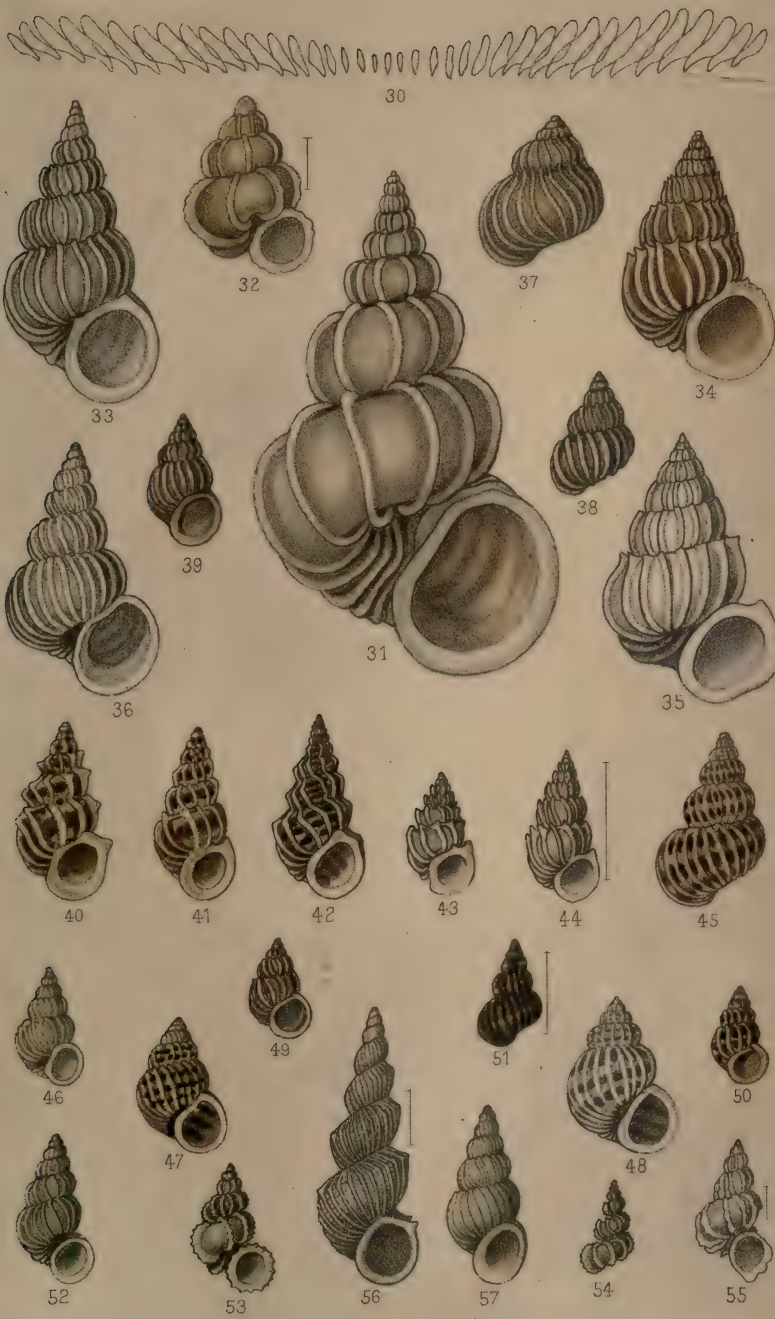
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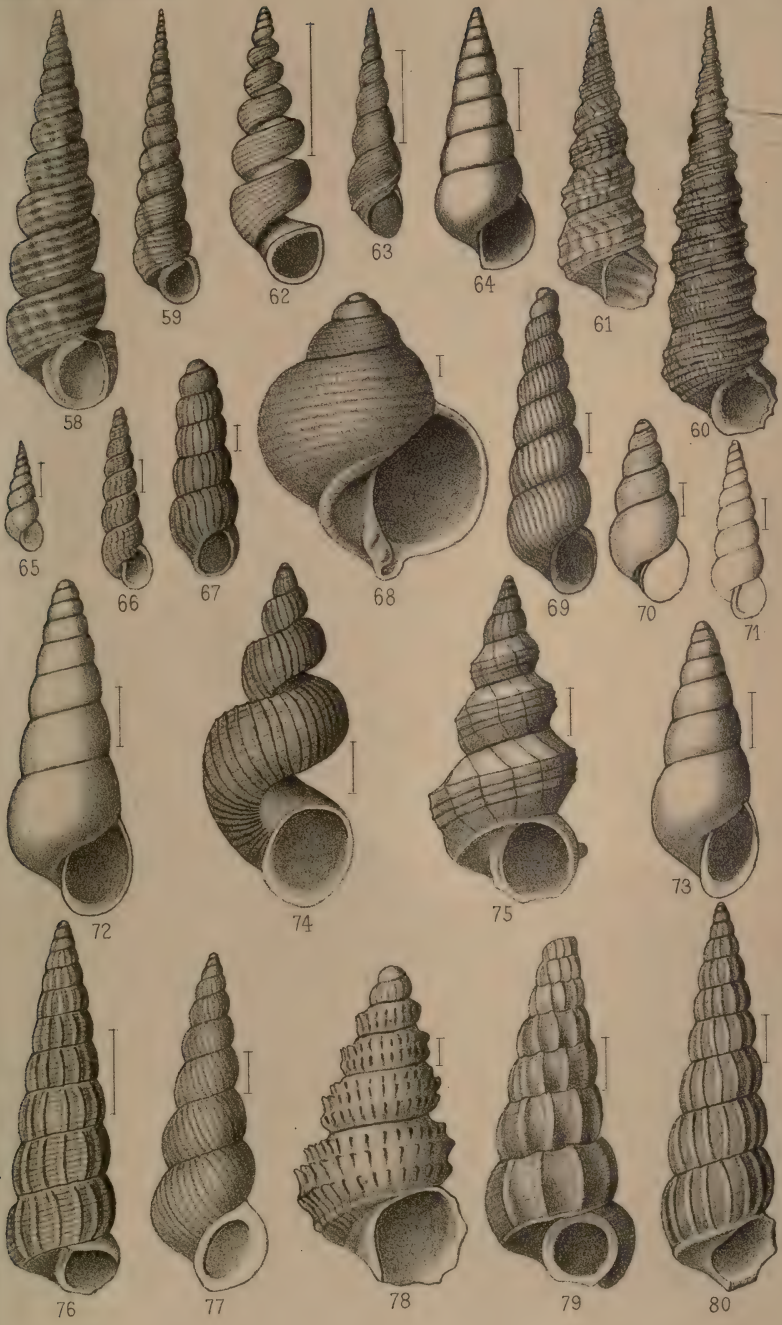
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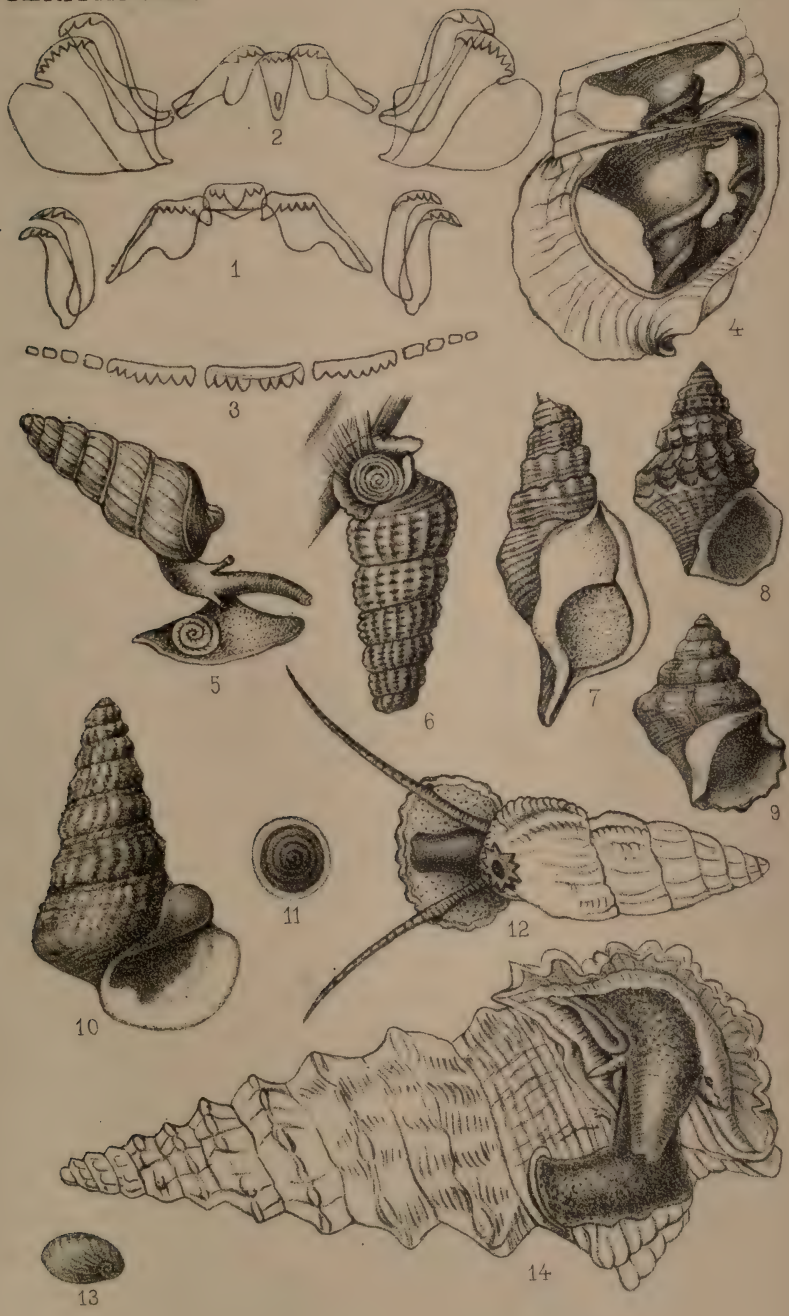
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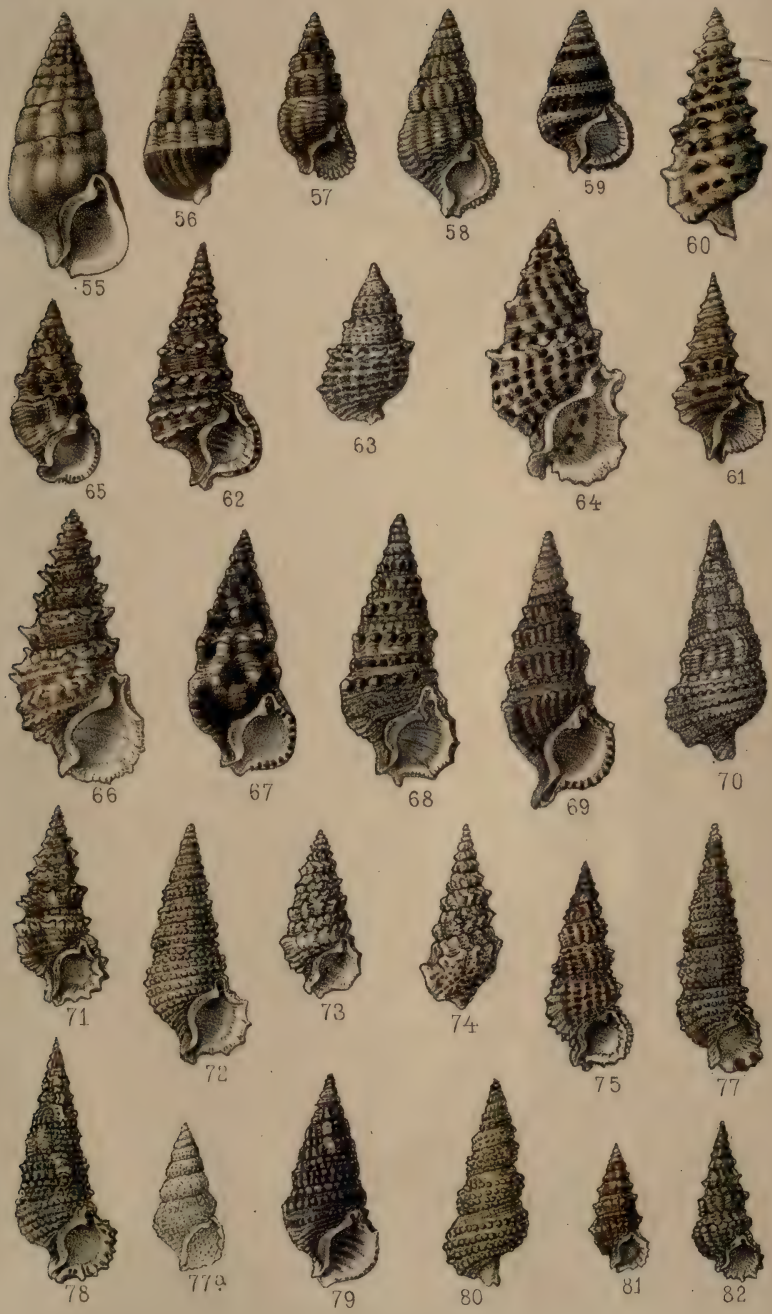
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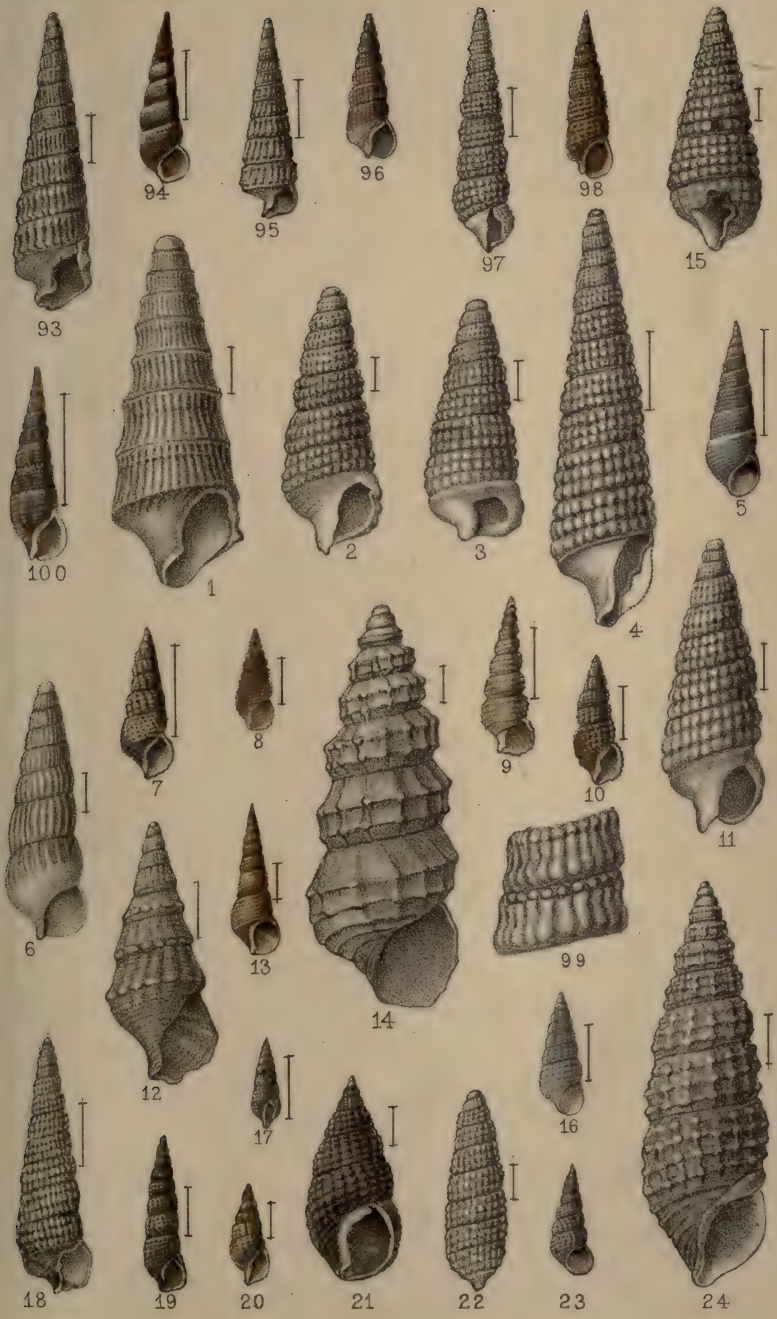
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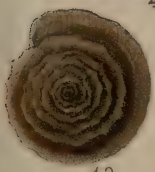

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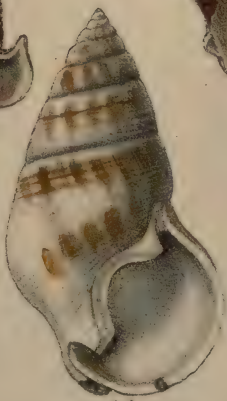

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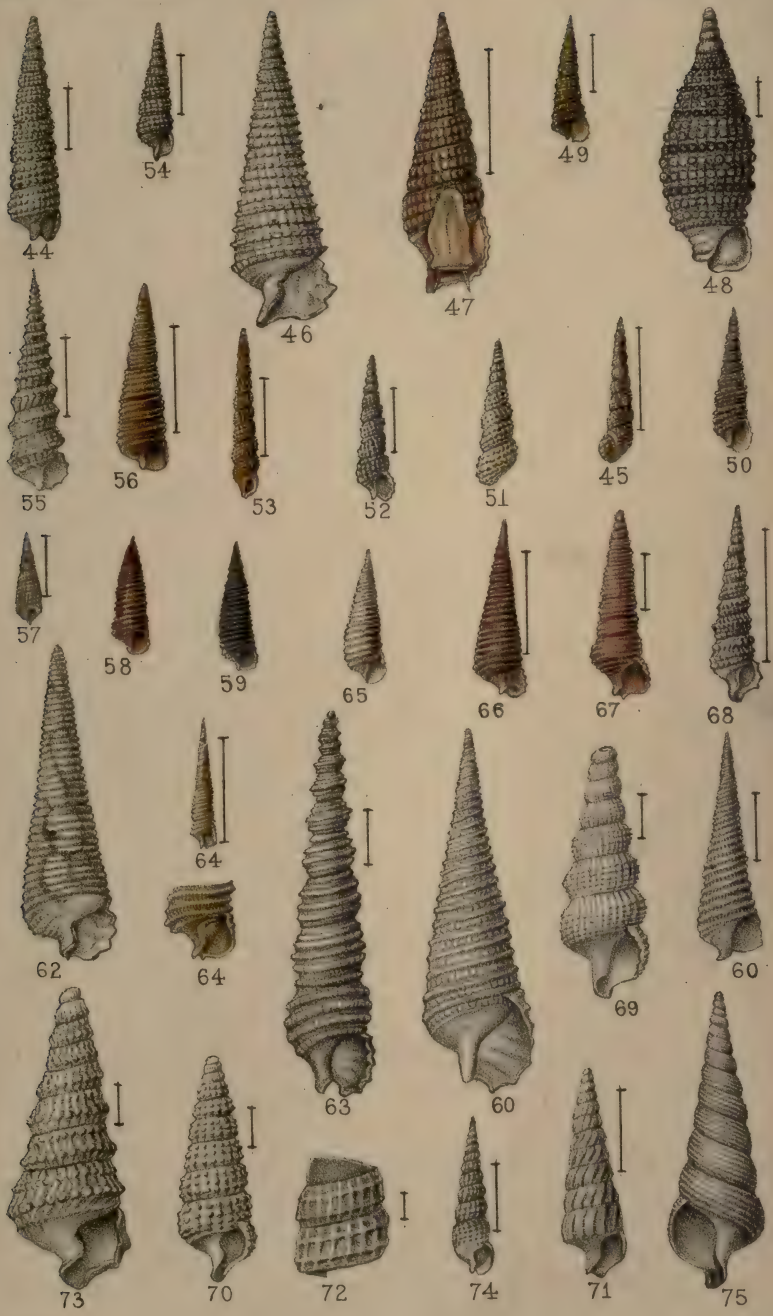
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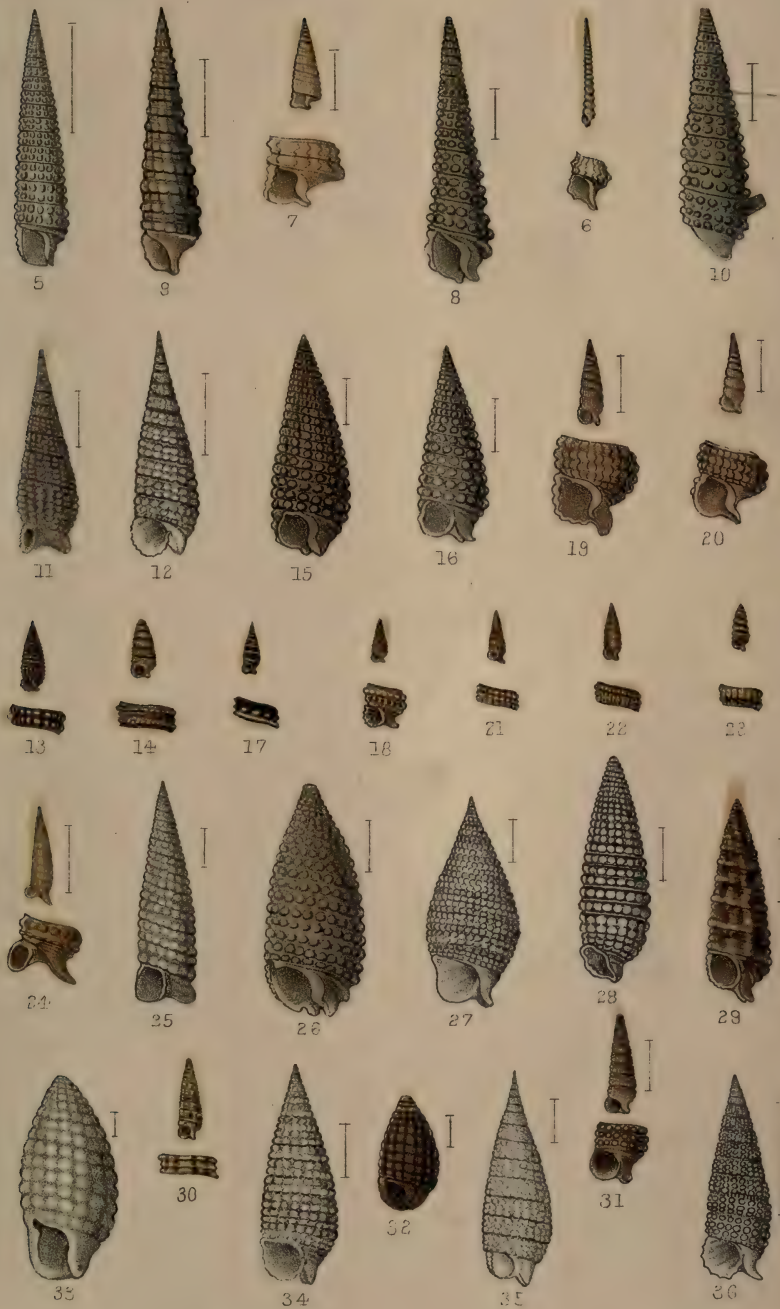
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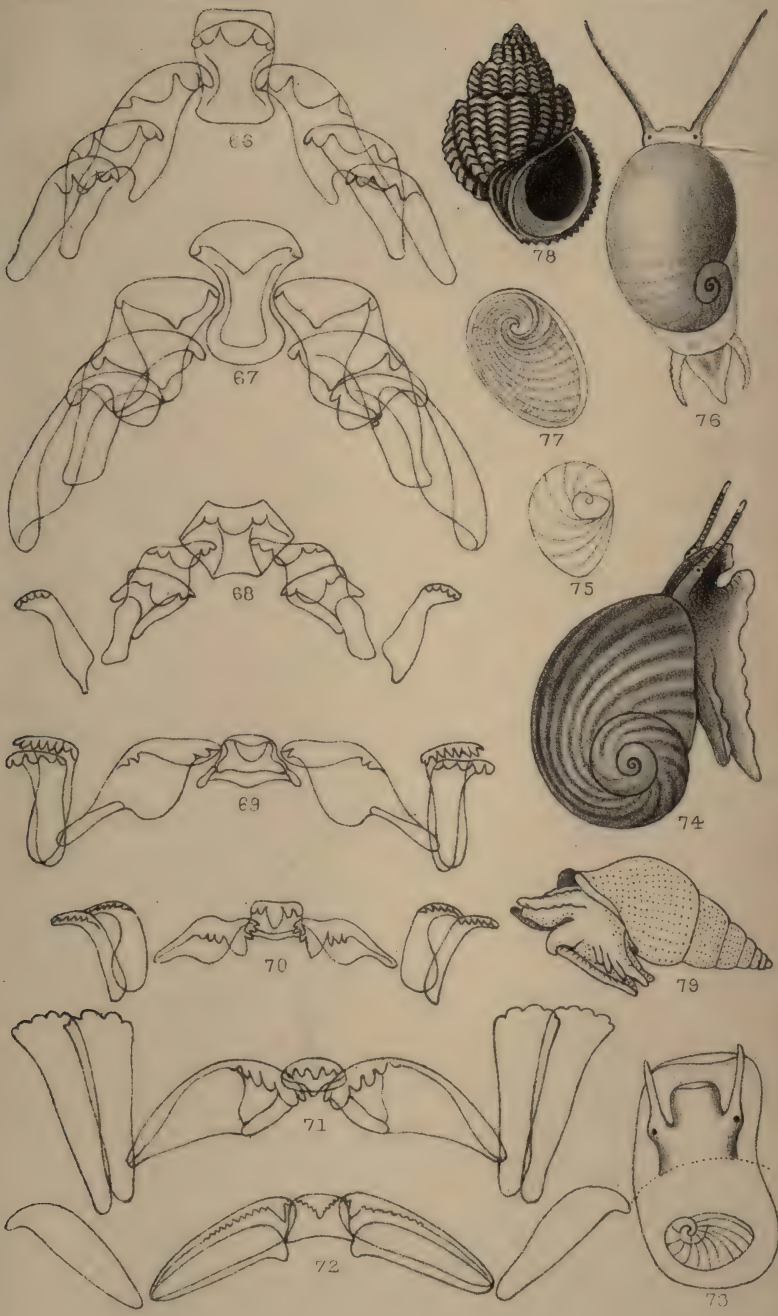
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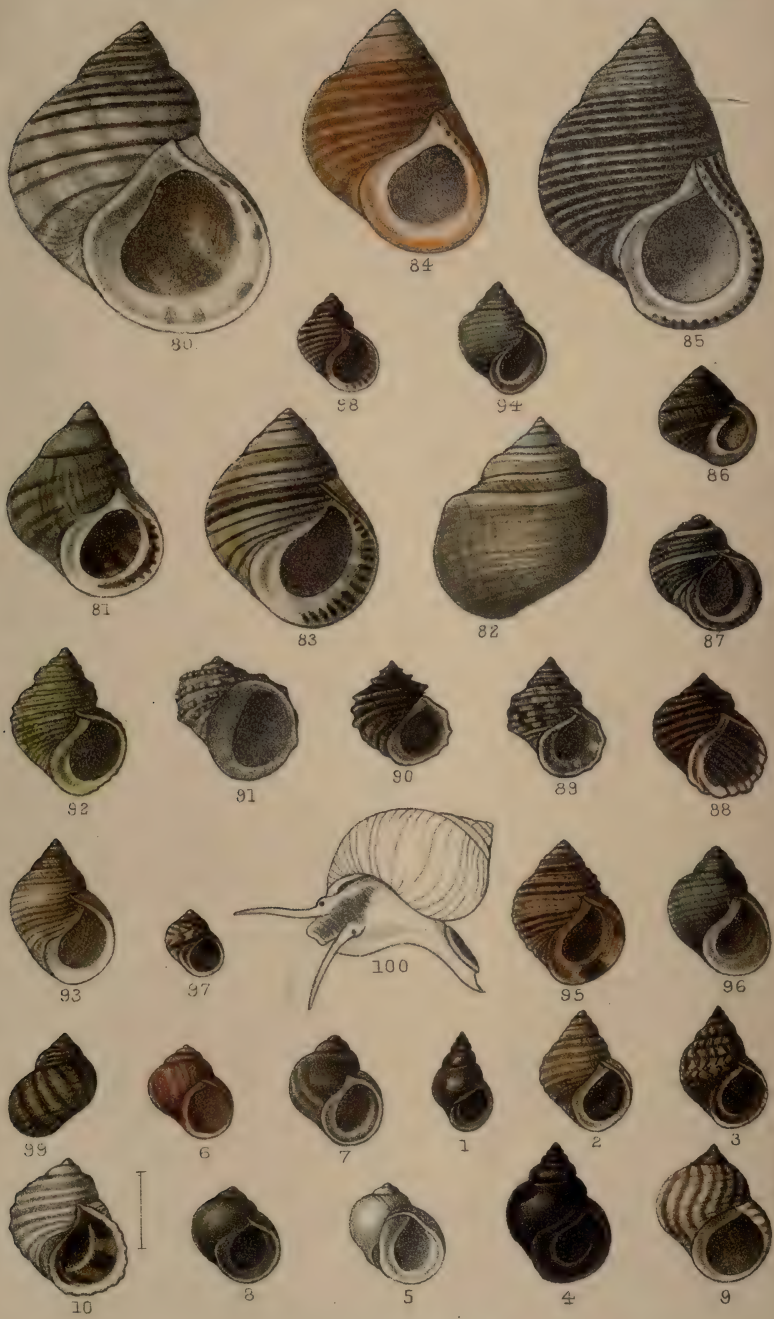
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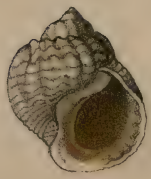
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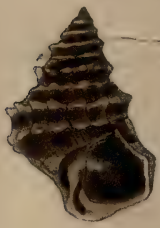
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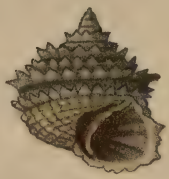
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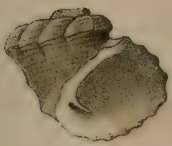
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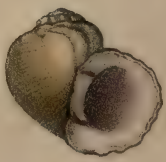
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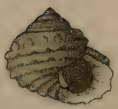
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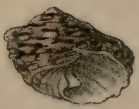
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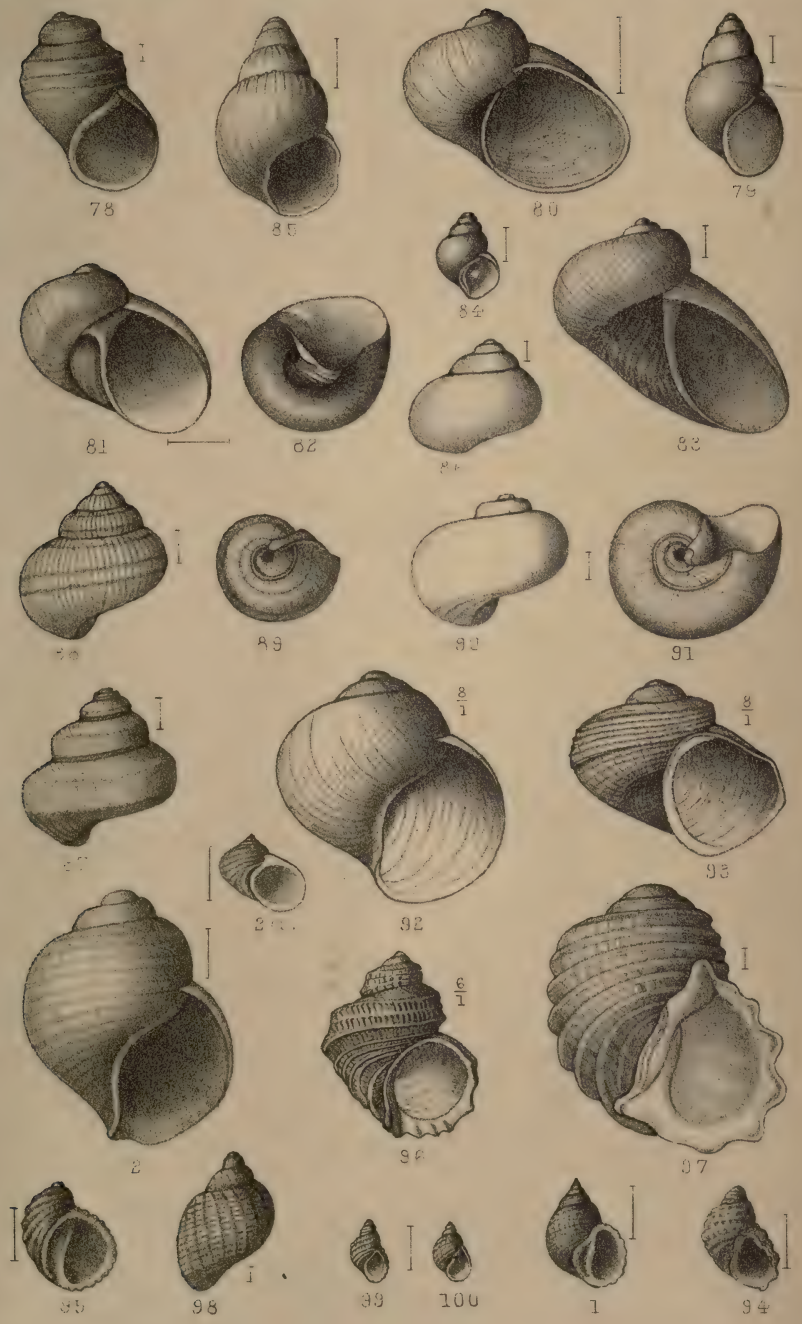
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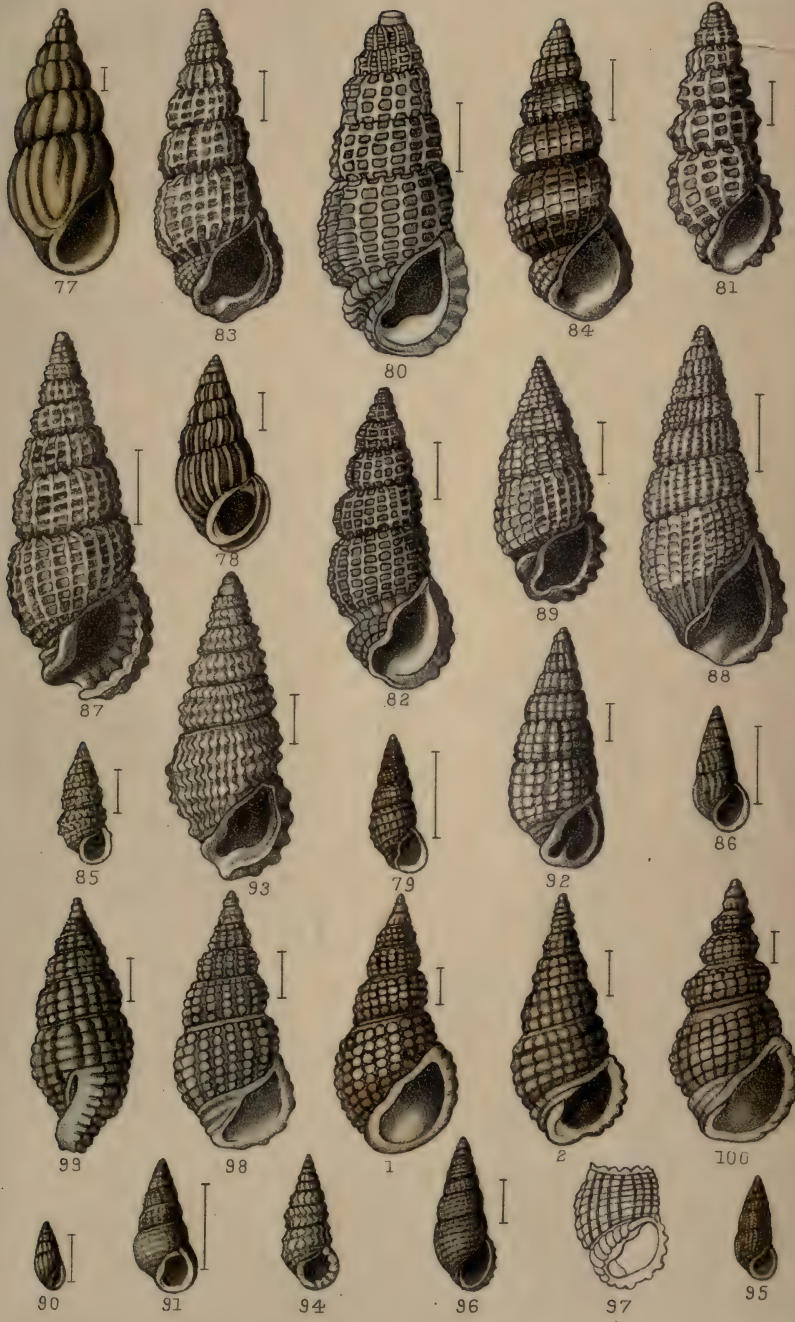
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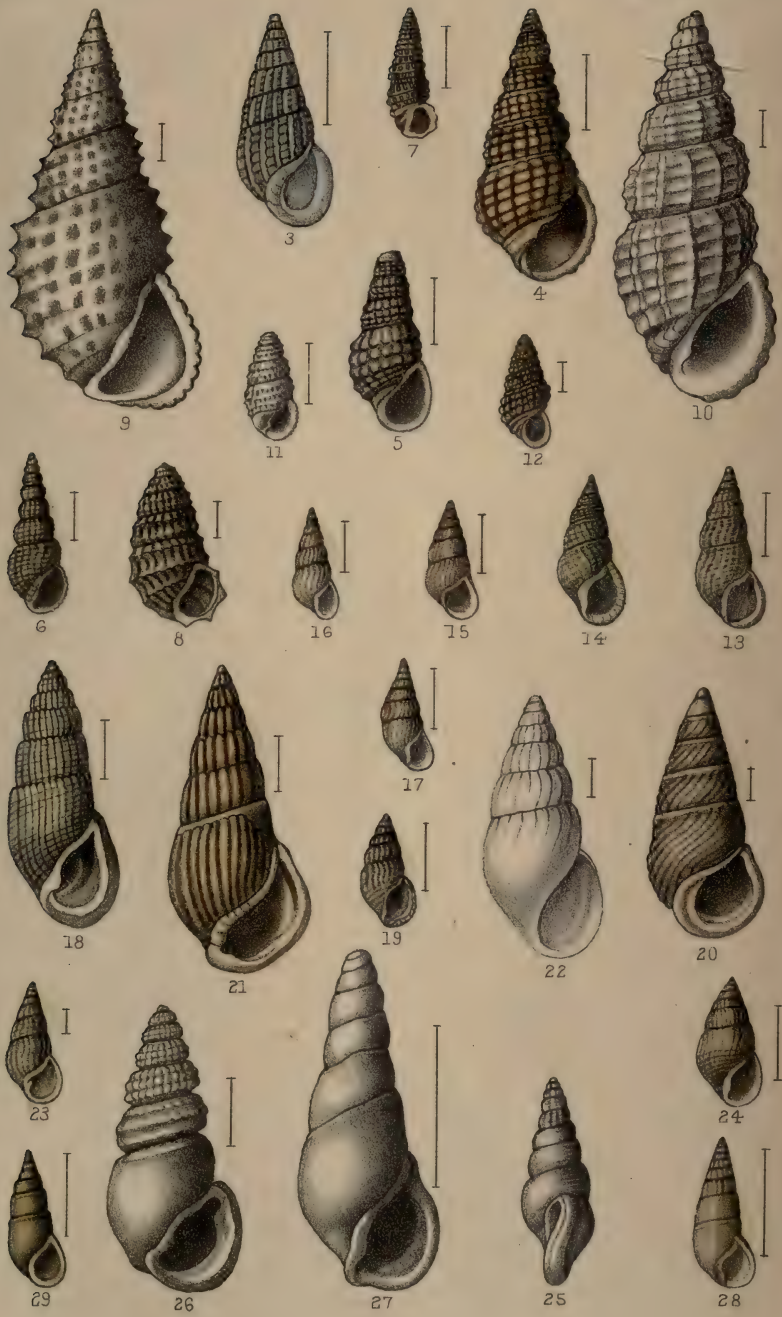
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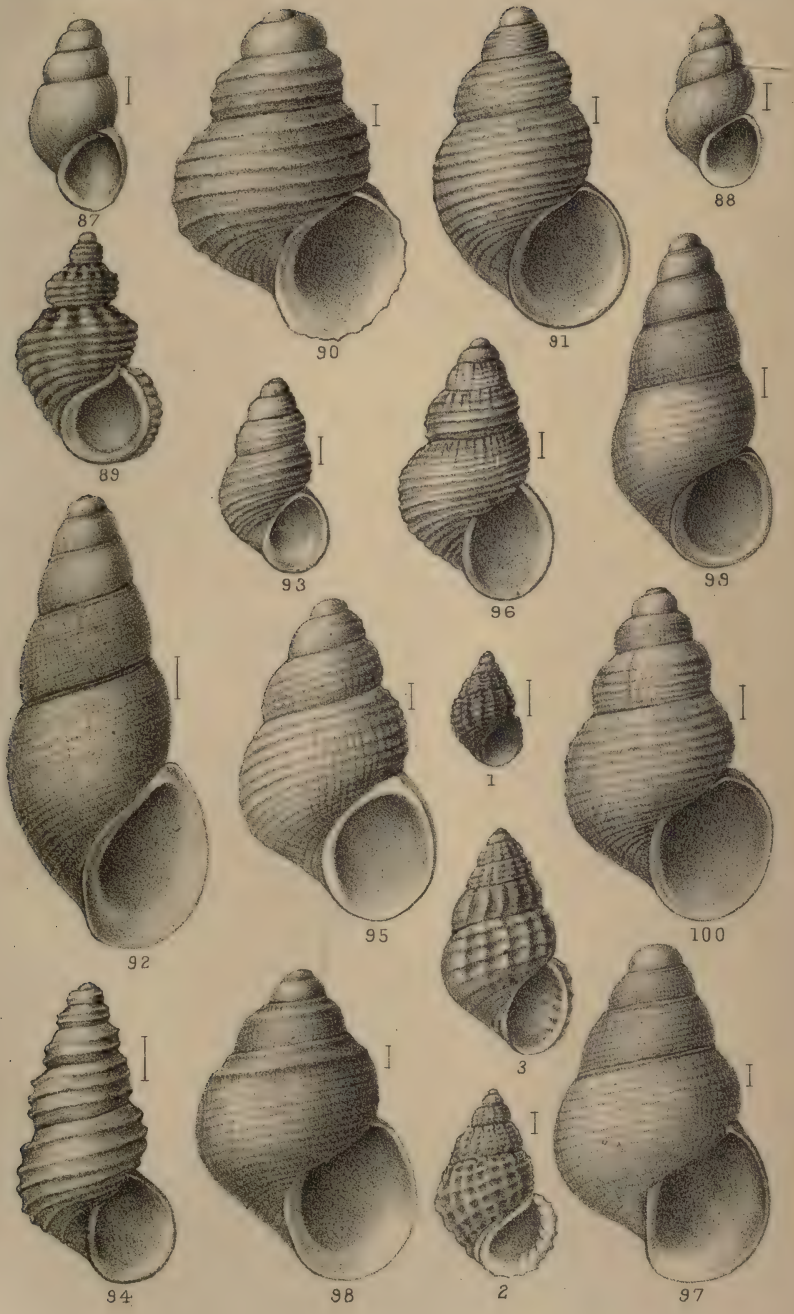
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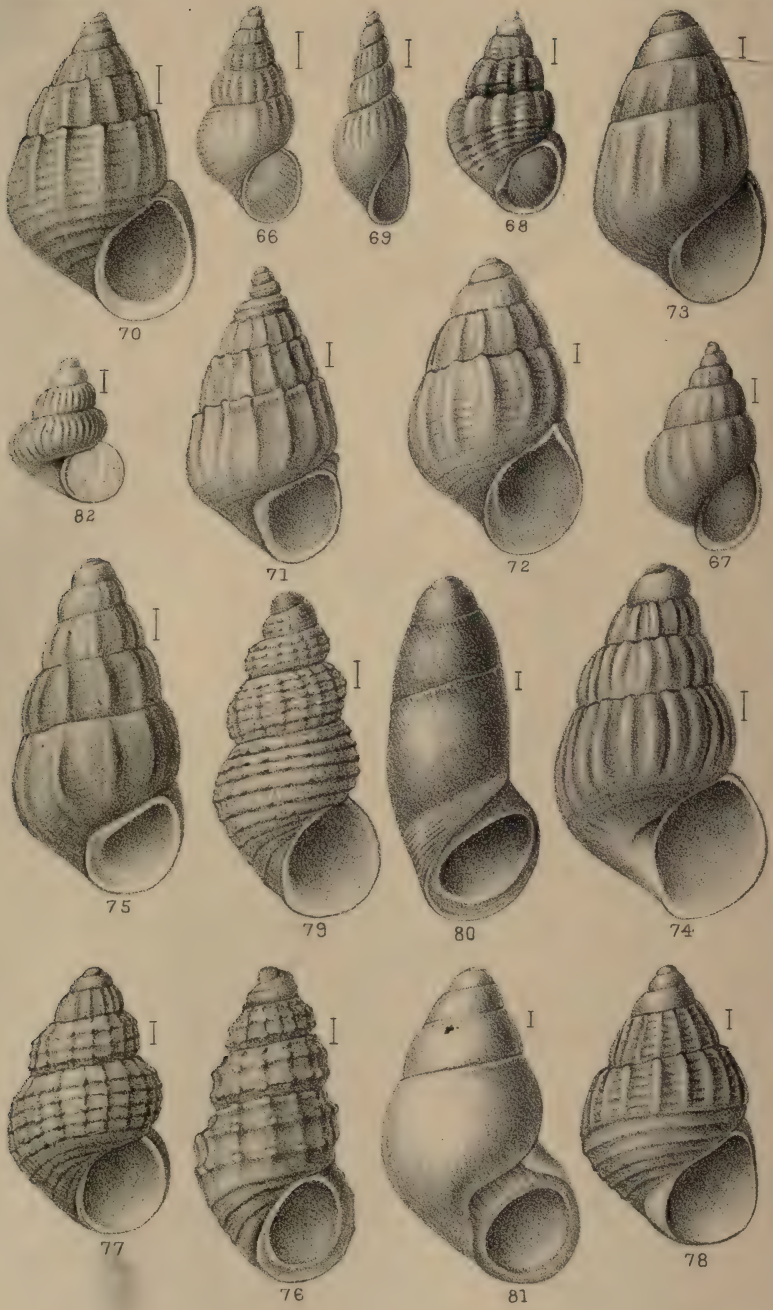
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